FINAL ENVIRONMENTAL IMPACT STATEMENT

Noxious Weed Management Projects

Bonners Ferry Ranger District

United States
Department of
Agriculture

National Agricultural Library

TABLE OF CONTENTS

SUMMARY

PROPOSED ACTION

The Bonners Ferry Ranger District proposes to control noxious weeds in certain geographical ecosystems on the district. Control alternatives include non-chemical and chemical treatment methods under an Integrated Pest Management program.

Currently 41 sites with noxious weeds have been identified. Sites range in size from 0.24 acres to 33 acres and total 335.55 acres. This area represents less than 0.08 percent of the four hundred ten thousand acres of National Forest System lands administered by the Bonners Ferry Ranger District. It is important to note that on many of these sites the infestations of noxious weeds are still very scattered, and not all of these acres would require treatment. For example, the largest site is 13.8 miles of road in the Smith, Cow, and Beaver Creek drainages where infestations of primarily meadow hawkweed can be found along the road.

Thirty-eight of the forty-one sites are infested with meadow hawkweed (*Hieracium pratense*)) or combinations of meadow hawkweed and spotted knapweed (*Centaurea maculosa*). Two of the sites are infested with Rush Skeleton Weed (*Chrondrilla juncea*), found in but three sites in Boundary County. One site, Roman Nose Lake #3, is infested with common tansy (*Tanacetum vulgare*). Ten other sites are infested with common tansy along with hawkweed, spotted knapweed, or thistles. Three sites are infested with Dalmation toadflax (*Linaria vulgaris*).

Twenty-five of the 41 sites are located in the Selkirk Ecosystem. Six sites are located in the Cabinet Mountains Ecosystem and seven sites are located in the Purcell Mountain ecosystem. Three sites are identified in the valley outside the three mountain ranges.

This Final Environmental Impact Statement (FEIS) examines several alternatives for treating these sites. These alternatives include a variety of methods including manual, cultural, and biological techniques. One alternative combines these non-chemical methods with herbicide applications. The effects of a no-action alternative are also analyzed.

The preferred treatment varies by site and can include either chemical, biological, or manual treatment or combinations of these treatments. A complete listing of preferred methods is provided in Table 2-1 (p. 2-6).

This analysis also assumes that new sites will be discovered in key ecosystems and that these sites are in land types analyzed in this document. These new infestations are assumed to increase the total infestation acreage by twenty percent. The impacts analysis in Chapter 4 assumes that these sites are treated chemically. All chemical applications are made with ground based equipment.

PURPOSE AND NEED FOR ACTION

Weed control is proposed in order to:

1. Protect the natural condition and biodiversity of the Selkirk and Cabinet Mountain Ecosystems by preventing the spread of aggressive, non-native plant species that displace native vegetation.

2. Prevent or limit the spread of noxious weeds in key low elevation lakes in the Purcell Mountain ecosystem. Lakes to be protected are Brush Lake, Dawson Lake, Robinson Lake, and Smith Lake. Campgrounds at these lakes under Forest Service jurisdiction and other campgrounds within this ecosystem will be targeted for weed control action.

3. Comply with Federal and State Laws regulating management of noxious weeds.

4. Cooperate with other agencies and private individuals, including adjacent landowners, concerned with the management of noxious weeds.

ALTERNATIVES:

Scoping

The public has been involved throughout the development of the EIS. Public comment has helped define the issues and develop the range of alternatives for accomplishing management goals and objectives.

Public comment was solicited formally with a notice published in the *Federal Register* that indicated our intent to prepare an EIS. Several articles published and news features in local newspapers solicited public input on the weeds in the Forest issue.

ISSUES

Analysis of public and internal input resulted in the following list of issues that guided the development of the alternatives. Each issue is stated as a question, often general in nature, and is followed by a synopsis of the specific comments received from the public. A brief discussion of how the issue is addressed in the EIS follows the synopsis of public comments.

1. What are the potential impacts of noxious weeds on resources such as ecological communities and processes; threatened, endangered, or sensitive plants and animals; soils; water quality; aesthetics; wildlife and fish; and recreational opportunities?

Most commenters viewed noxious weeds as a potential problem in the National Forests. Many have seen the impacts of non-native plants on vast areas. One commenter questioned our use of the terms "native" and "noxious" species.

The Environmental Consequences section of this EIS (Chapter 4) discusses the impacts of noxious weeds on various resources.

2. What are the potential impacts of weed control methods on other forest resources as listed in issue 1?

Although most commenters acknowledge the potential threat of noxious weeds, some question whether the use of herbicides in the Forest would be appropriate. Some commenters were concerned about the impact of herbicides on the biological resources. Others advocated a full range of control measures, including herbicide use, to reduce the threat.

A full range of alternatives is developed in chapter 2, and the environmental, social, and economic consequences of the alternatives are presented in Chapter 4.

3. How would the weed management methods, particularly herbicide application, affect human health?

Some commenters were specifically concerned about the impact of herbicide spraying on human health and on traditional hunting and gathering activities.

The potential impacts of herbicide application on human health have been analyzed extensively. Chapter 4 presents the results of this analysis.

ALTERNATIVES CONSIDERED IN DETAIL

BRIEF OVERVIEW

Four alternatives were developed to address the issues raised by public and agency comment. These alternatives represent the range of control methods currently available for treatment of noxious weeds. In addition to the No Action alternative, two of the action alternatives involve only non-chemical methods of control. The comparison of these alternatives with the alternative that includes chemical use sharply defines the issue of possible human health and environmental impacts of herbicide use. The analysis of the No Action alternative addresses the impacts of the unchecked expansion of noxious weeds in the Forest.

The four alternatives are outlined below with a brief discussion of the major issues relevant to these alternatives. Each of these alternatives, except the No Action alternative, involve a combination of treatment methods.

ALTERNATIVE 1: No Action

This alternative would result in a change in the current noxious weed control activities on the Bonners Ferry Ranger District. Control activities would be restricted to minimal amounts of manual control.

The comparison of this alternative with the active control alternatives highlights the potential effects of uncontrolled weeds on the forest environment. The No Action alternative also provides a baseline for analyzing the possible adverse impacts of the control alternatives.

ALTERNATIVE 2: Manual and Cultural Control

This alternative was developed in response to the possible impacts of treatment methods, such as chemical control, on non-target plants, and human health. Under this alternative, treatments such as hand pulling, clipping, and mowing would be implemented to destroy or limit reproduction of the weed species. Cost effectiveness and environmental/human health trade-offs can be compared between this alternative and other proposed alternatives.

ALTERNATIVE 3: Manual, Cultural and Biological Control

This alternative was developed in response to many of the same issues that prompted the development of Alternative 2. Under this alternative, treatments previously mentioned under Alternative 2 would be supplemented with the release of biological agents such as parasites, predators and pathogens that have shown some promise in reducing weed infestations. This alternative allows us to examine the possible impacts of introducing species that show some promise in bringing exotic plant species into better balance in these ecosystems. At the present time relatively few biological control agents are available that are effective against the weed species of concern here. However, some agents have shown promise in controlling Canada thistle. Cost effectiveness and environmental trade-offs between this alternative and other alternatives can be examined.

ALTERNATIVE 4: Manual, Cultural, Biological and Chemical Control

Under this alternative a full range of treatments would be considered for each site. Herbicide prescriptions would be consistent with or more restrictive than product label requirements. If an herbicide is used in the annual floodplain, the Forest Service would only apply a herbicide formulation approved by the U.S. Environmental Protection Agency for direct applications to water. In no case would the Forest Service apply herbicide directly to water.

This alternative allows us to compare the cost and effectiveness of the chemical use with the potential environmental and health effects of this and other methods.

ALTERNATIVES CONSIDERED BUT NOT GIVEN DETAILED STUDY

Additional alternatives and methods were considered by not given detailed study. These include use of the herbicide glyphosate (the active ingredient in Round-up) and grazing. The reasons for not considering these alternatives in detail are provided in Chapter 2.

AFFECTED ENVIRONMENT

The 41 sites proposed for treatment are located in either the Purcell, Cabinet, or Selkirk Mountain Ecosystems on the Bonners Ferry Ranger Districts. These ecosystems lie within portions of northern Idaho, northwestern Montana, and/or southern British Columbia.

Most of the proposed projects sites are located adjacent to forest roads. A couple sites are located along trails that lead to relatively pristine portions of the Selkirk Ecosystem.

Portions of two major river drainages (Kootenai River and Moyie River) are located on the Bonners Ferry Ranger District. The valleys of these two river drainages are typical intermountain glaciated valleys which have been subject to extensive stream action since glacial times. The valleys generally range from .5 to 2 miles wide; however, narrow steep canyons also occur on the lower end of the Moyie River valley. Elevations on the valley floor range from 1800 feet near the Canada/U.S. bound-

ary along the Kootenai River to 2633 feet where the Moyie enters the United States from Canada. From the valley floors, the mountains rise abruptly to elevations over 7500 feet.

The climate of the area is primarily affected by maritime weather patterns that are occasionally modified by continental air masses. Weather varies considerably with elevation, slope aspect, and season. Annual precipitation ranges from 25 inches on the valley floor to 80 inches or more in the higher elevations. Snow provides approximately 40 to 80 percent of the total precipitation depending on the location. Snow cover in open areas on the lower to mid valley floors typically vanishes in March or April. Snow accumulation is much greater in the higher elevations and can linger into the summer months.

Soils in the valley floors and lower valley slopes have developed from two types of parent materials: materials deposited by glaciers (glacial tills) and post-glacial alluvial deposits. Glacial materials are often deposited as unstratified clayey and loamy deposits. Water-deposited materials occur on the stream terraces and alluvial fans of the valley bottoms. Soils on the higher terraces have developed in stratified sand, gravel, and cobble. Soils on the lower terraces have developed in stratified silts, sands and gravels which are frequently deposited and disturbed.

Soil development has also been affected by wind-deposited, volcanic ash. Soils in relatively undisturbed areas on the valley floor often contain soil profiles several inches in depth that have been significantly affected by volcanic deposits that originated in Cascade Range eruptions such as Mount Mazama.

The vegetation is a complex mosaic of different aged stands of *Pinus contorta* (lodgepole pine), *Pseudotsuga menziesii* (Douglas-fir), *Pinus ponderosa* (Ponderosa pine), *Larix occidentalis* (Larch), *Picea* (Spruce), *Abies lasiocarpa* (sub-alpine fir), Tsuga heterophylla (western hemlock), and Thuja plicata (western redcedar).

Douglas-fir is believed to be the climax tree species on most dry sites. Common shrubs include *Arctostphylos uva-ursi* (kinnikinnik), *Berberis repens* (Creeping Oregon grape), *Symphoricarpos albus* (Snowberry), *Holodiscus discolor* (ocean spray), and *Physocarpus malvacea*, ninebark. More mesic (moister) sites support an understory of *Linnaea borealis* (twinflower), Oregon grape, kinnikinnick, *Cornus stolonifera* (Red-osier dogwood), *Shepherdia canadensis* (Buffalo-berry), *Agrostis stolonifera* (Redtop), and *Aster occidentalis* (Western aster). On moister sites larch is fairly extensive on the lower to mid slopes.

Lodgepole pine is the most abundant conifer found throughout the area in all but the higher elevations. It occurs in all densities and age class distributions, and is frequently in pure, even-aged stands.

Ponderosa pine is found to a limited extent on some of the dry sites at low elevations. This species often occurs in the open, park-like stands. Understories in these stands are dominated by bluebunch wheatgrass, rough fescue, and other bunchgrass species. Scattered Douglas-fir and lodgepole pine are also found on these sites and account for most of the coniferous reproduction.

Spruce grows over a wide range of elevations on sites with abundant soil moisture. Spruce is found primarily in riparian areas and with sub-alpine fir on mesic northerly slopes.

River bottom lands are well vegetated with conifers, primarily lodgepole pine, Douglas-fir, larch, ponderosa pine, and Engelmann spruce. Associated hardwood tree species include birch, cottonwood, and aspen with willow, alder, and other shrubs.

COMPARISON OF THE ALTERNATIVES CONSIDERED IN DETAIL

Chapters 2 and 4 discuss the impacts of the alternatives on the affected resources of the sites under consideration. Potentially affected resources range from the vegetation community to water quality, fihseries and human health. A brief synopsis of central findings is provided in this summary. The interested reader is encouraged to read Chapter 4 for a more complete disclosure.

Table S-1 summarizes the risk of spread of noxious weeds under the various alternatives.

Table S-1--Relative risk of the spread of noxious weeds.

Alternative 1: No Action	Highest risk of spread of any of the alternatives. Greatest risk that new invading species would find a place establish populations and spread.
Alternative 2: Manual & Cultural	Low risk if carried out at least three times per year on an annual basis. Risk of vegetative spread may be higher than with herbicide control.
Alternative 3: Manual, Cultural & Biological	Low to moderate risk if manual and cultural control is carried out at least three times per year on an annual basis. Moderate risk of vegetative spread if climatic conditions are not suitable for the biological agents.

Table S-1--Relative risk of the spread of noxious weeds. (continued)

Alternative 4: Manual, Cultural, Biological & Chemical	Low risk assuming careful follow-up spray and assuming manual and cultural control is carried out at least three times per year in areas close to water. Biological control may reduce the competitiveness of Canada thistle but there is potential for continued spread.

Table S-2 summarizes the environmental impacts of the various alternatives.

Table S-2--Summary of environmental impacts of the alternatives

Alternative 1: No action	Impacts are related to the spread of noxious weeds.
Alternative 2: Manual & Cultural	Minimal impacts. Minor soil disturbance.
Alternative 3: Manual, Cultural & Biological	Low impact expected on native vegetation.
Alternative 4: Manual, Cultural, Biological & Chemical	Visual impacts of site treatment has the potential to disrupt some users experiences. Analysis does not indicate a risk of significant impacts on fish and wildlife. Short term localized impacts on some broadleaf species.

IMPACT OF THE CONTROL ALTERNATIVES ON HUMAN HEALTH

The non-chemical alternatives would have little impact on human health and safety. The manual and mechanical alternatives could result in sprains, minor irritations, or injury from flying objects.

Current toxicology data supporting the registration of these herbicides indicate that these compounds provide low risk when used as directed. The issues of carcinogenicity, mutagenicity, and generalized health effects are addressed in Chapter 4. The risks of long-term deferred effects such as cancer are considered very slight and on the order of other risks commonly encountered in everyday life (for example, the cancer risks of transcontinental air flight from increased exposure to cosmic radiation). The exposures to chemicals from these projects would be quite transient and minimal, even on a cumulative basis.

There will always remain some uncertainty regarding the effects of herbicide exposure on human health. Sources of uncertainty include the necessary extrapolation of toxicology data from laboratory animals to humans, the use of high-dose cancer studies to predict rates of cancer from low doses, and the difficulty of predicting human dose levels under the conditions anticipated here. To compensate for this uncertainty, risk was analyzed conservatively which tends to overstate the risk. These factors are reviewed in Chapter 4 and in the Risk Analyses contained in the project file.

CHAPTER 1
PURPOSE AND NEED FOR ACTION

INTRODUCTION

This chapter:

1. Describes what the Bonners Ferry Ranger District proposes to do.

2. Explains why the proposed actions are needed.

3. Locates the infested areas proposed for treatments with further reference to a separate map document (Appendix A).

PROPOSED ACTION

The Bonners Ferry Ranger District proposes to control noxious weeds in certain geographical ecosystems on the district. Control alternatives include non-chemical and chemical treatment methods under an Integrated Pest Management program.

In the past several years the Bonners Ferry Ranger District has conducted extensive inventories of noxious weeds on large portions of the ranger district. District personnel have searched all suitable and likely locations including travel corridors, campsites, and vulnerable habitats. The district has also been treating noxious weeds as directed in the Idaho Panhandle National Forest Weed Pest Management EIS. In addition to some chemical control of noxious weeds, the District has also released biological control agents, completed roadside grass seeding and fertilization, disseminated noxious weed information to the public, and will, in 1996, implement a noxious weed free hay policy.

Currently 41 sites with noxious weeds have been identified. Sites range in size from 0.24 acres to 33 acres and total 335.55 acres. This area represents less than 0.08 percent of the four hundred ten thousand acres of National Forest System lands administered by the Bonners Ferry Ranger District. It is important to note that on many of these sites the infestations of noxious weeds are still very scattered, and not all of these acres would require treatment. For example, the largest site is 13.8 miles of road in the Smith, Cow, and Beaver Creek drainages where infestations of primarily meadow hawkweed can be found along the road.

Thirty-eight of the forty-one sites are infested with meadow hawkweed (*Hieracium pratense*)) or combinations of meadow hawkweed and spotted knapweed (*Centaurea maculosa*). Two of the sites are infested with Rush Skeleton Weed (*Chrondrilla juncea*), found in but three sites in Boundary County. One site, Roman Nose Lake #3, is infested with common tansy (*Tanacetum vulgare*). Ten other sites are infested with common tansy along with hawkweed, spotted knapweed, or thistles. Three sites are infested with Dalmation toadflax (*Linaria vulgaris*).

Twenty-five of the 41 sites are located in the Selkirk Ecosystem. Six sites are located in the Cabinet Mountains Ecosystem and seven sites are located in the Purcell Mountain ecosystem. Three sites are identified in the valley outside the three mountain ranges.

This Final Environmental Impact Statement (FEIS) examines several alternatives for treating these sites. These alternatives include a variety of methods including manual, cultural, and biological techniques. One alternative combines these non-chemical methods with herbicide applications. The effects of a no-action alternative are also analyzed.

The preferred treatment varies by site and can include either chemical, biological, or manual treatment or combinations of these treatments. A complete listing of preferred methods is provided in Table 2-1 (p. 2-6).

This analysis also assumes that new sites will be discovered in key ecosystems and that these sites are in land types analyzed in this document. These new infestations are assumed to increase the total infestation acreage by twenty percent. The impacts analysis in Chapter 4 assumes that these sites are treated chemically. Chemicals will be applied with either backpack sprayers or

for pumper units mounted in the back of pickup trucks. There are no aerial applications proposed.

PURPOSE AND NEED FOR ACTION

Weed control is proposed in order to:

1. Protect the natural condition and biodiversity of the Selkirk and Cabinet Mountain Ecosystems by preventing the spread of aggressive, non-native plant species that displace native vegetation.

2. Prevent or limit the spread of noxious weeds in key low elevation lakes in the Purcell Mountain ecosystem. Lakes to be protected are Brush Lake, Dawson Lake, Robinson Lake, and Smith Lake. Campgrounds at these lakes under Forest Service jurisdiction and other campgrounds within this ecosystem will be targeted for weed control action.

3. Comply with Federal and State Laws regulating management of noxious weeds.

4. Cooperate with other agencies and private individuals, including adjacent landowners, concerned with the management of noxious weeds.

The designation of a plant species as a "noxious weed," therefore a target of control efforts, involves a series of value judgements. The evaluation process is based in part on Federal and State Law. The Federal Noxious Weed Act of 1974 defines a "noxious weed" as "a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock or the fish and wildlife resources of the United States or the public health"(P.L. 93-629). The Idaho Noxious Weed Law defines a "noxious weed" as any exotic plant species established or that may be introduced in the state which may render land unsuitable for agriculture, forestry, livestock, wildlife, or other beneficial uses and is further designated as either a state-wide or county-wide noxious weed (Idaho Code 24 Chapter 22).

Both the Federal and State laws define "noxious weeds" primarily in terms of interference with the commodity uses of land. The ability of spotted knapweed, common tansy, hawkweed, and other noxious weeds to interfere with agricultural production has been widely demonstrated. However, this definition is also relevant for National Forest areas as these species interfere with the benefits of natural, complete ecosystems.

The proposed treatment of 335 acres identified in the proposed action does not reflect the enormity of the noxious weed problem in Boundary County as a whole. Spotted knapweed has been estimated to infest about 50 thousand acres of land in Boundary County, and hawkweed is estimated at 25,000 acres in the County (Personal Communication, Rich DeCarlo, Boundary County Weed Supervisor, 1995). Once a site is infested by these weeds, the weed species often becomes dominant and greatly reduces the native grass and forb community and the grazing value of the land. Several researchers have shown reductions in native species of up to 90 percent on sites infested with leafy spurge or knapweed (Belcher and Wilson 1989; Tyser and Key 1988; Watson et al. 1989; Willard et al. 1988). Increasing concern has also been expressed about the impacts of noxious weeds on wildlife, water quality, natural diversity, and other non-commodity resources (Willard et al. 1988; Lacey et al. 1989).

The Forest Service is also interested in increasing cooperation with State and local efforts to control noxious weeds. In Idaho, the Idaho Noxious Weed Law (Idaho Code 22 Chapter 24) states that is unlawful for any individual to allow noxious weeds to propagate or go to seed on their land unless they are complying with an approved weed management plan. This law directs the counties to develop weed control districts to plan and implement weed control efforts.

SCOPE OF THE PROPOSED ACTIVITIES

Treatment is proposed on 41 sites on the Bonners Ferry Ranger District of the Idaho Panhandle National Forests. Sites have been grouped into one of 3 "geographical ecosystems". These geographical ecosystems are physically separated by either the Kootenai River or the Purcell Trench. Each of the

three is associated with a particular mountain range, namely the Purcells, the Cabinets, or the Selkirks. Site maps are provided in Appendix A, and the areas are briefly described below.

In many of the following descriptions, a distinction is made between the total area of an infested site and the area within the perimeter of the infested site that is occupied by weeds. On many sites the current infestation is concentrated in spots on the sites. Thus the treatment may be confined to a smaller area than that reflected in the total site acreage.

Selkirk Mountain Ecosystem

Site #1a. Snow Creek Road #402.
T62N, R1W, Sec. 28-34; T62N, R2W, Sec 25, 34, 35; T61N, R1W, Sec 1-3. Spotted knapweed, meadow hawkweed, common tansy, perimeter of the infestation encompasses approximately 18 acres, while the major infestation is about 10 acres. This is a right-of-way site along the main road in the Snow Creek drainage.

Site #1b. Caribou Pass Road #1007 North
T62N, R2W, Sec. 34-36. Meadow and orange hawkweed, perimeter of the infestation encompasses approximately 4.8 acres. Site is a road right-of-way with sporadic populations on both sides of road.

Site #1c. Caribou Pass Road #1007 South.
T61N, R2W, Sec. 1 and 2. Meadow hawkweed, perimeter of the infestation encompasses approximately 0.73 of an acre. Site occurs along road right-of-way.

Site #1d. Snow Ridge Road 2624.
T62N, R1W, Sec. 34 Common tansy, meadow hawkweed, perimeter of the infestation encompasses approximately 7.3 acres, while the majority of the infestation measures 2.3 acres. Site occurs along road right-of-way.

Site #1e Roman Nose Lake #3
T61N, R2W, Sec. 14. Common tansy, perimeter of the infestation encompasses approximately 0.24 acres. Site occurs within the Roman Nose Lake #3 basin.

Site #2a. Cascade Creek Road #2411 and Lower Myrtle Creek Road #633
T62N, R1W, Sec. 14, 22, and 23. Spotted knapweed, perimeter encompassess approximately 7.3 acres. Site occurs along road right-of-way. Myrtle Creek is the municipal water source for Bonners Ferry.

Site #2b. Myrtle Creek Road #633
T62N, R1W, Sec. 18; T62N, R2W, Sec. 13, 14. Spotted knapweed, perimeter of the infestation encompasses approximately 6.7 acres, with the actual infestation consisting of approximately 1.0 acre. Site occurs along road right-of way. Myrtle Creek is municipal water source for Bonners Ferry.

Site #2c. Upper Myrtle Creek Road #633 and Two Mouth Lakes Trail.
T62N, R2W, Sec. 20. Meadow hawkweed, perimeter of the infestation encompasses approximately 0.48 acres. Site occurs along road and trail right-of-way.

Site #3a. Ball Creek Road #432.
T63N, R1W, Sec. 22-24. Spotted knapweed, meadow hawkweed, perimeter of the infestation encompasses approximately 6.3 acres with a net infestation of one acre. Site occurs along the road right-of way of the main road in the Ball Creek drainage.

Site #3b. Upper Ball Creek Road #432 and Road #2411
T63N, R1W, Sec. 19 and 20; T63N, R2W, Sec. 24-26. Meadow hawkweed, common tansy, perimeter encompasses 9.6 acres, while net acres measure approximately 1.5 acres. Site occurs along road right-of-way.

Site #4. Trout Creek Road #2426.
T63N, R1W, Sec. 7-11. Spotted knapweed, meadow hawkweed, perimeter encompasses approximately 13.1 acres, net acres measuring approximately 2 acres. Site occurs along road right-of-way.

Site #5. Trout Creek Cattle Allotment.
T63N, R1W, Sec. 11. Meadow and orange hawkweed, spotted knapweed, common tansy, perimeter encompasses approximately 8 acres. Site occurs within Ball Creek cattle allotment, an on and off allotment where

there are extensive efforts to control weeds on the private grazing land.

Site #6. Parker Ridge Trail.
T64N, R1W, Sec. 8. Spotted knapweed, hawkweed, perimeter encompasses approximately 0.9 acres, while net acres measure approximately 0.5 acres. Site occurs along first 1.2 miles of trail right-of-way.

Site #7. Long Canyon Creek Trail.
T65N, R2W, Sec. 36. Canada thistle, common tansy, meadow and orange hawkweed, perimeter encompasses approximately 0.5 acres. Site occurs at trailhead parking lot and first 0.5 miles of trail right-of-way.

Site #8a. Lower Smith Creek Road #281.
T65N, R2W, Sec. 23, 27, 33, and 34. Spotted knapweed, meadow hawkweed, common tansy, perimeter encompasses approximately 9.6 acres, while net acres measure approximately 2.5 acres. Site occurs along road right-of-way.

Site #8b. Smith Creek Road #281, Beaver Creek Road #2545, Cow Creek Road
Creek Road #655, Dead Cow Creek Road #3303, Shorty Pass Road #282, Saddle Pass Road #2454.
T64N, R3W, Sec. 1-11; T65N, R3W, Sec. 33. Hawkweed, spotted knapweed, perimeter encompasses approximately 33 acres, while net acres measure 8 acres. Site occurs along road right-of-ways.

Site #8c. Upper Smith Creek Road #281 and West Fork Road #2464.
T63N, R3W, Sec. 3, 10, 11. Meadow hawkweed, perimeter encompasses approximately 17 acres, while net acres measure approximately 2 acres. Site occurs along road right-of-way.

Site #8d. Cow Creek Cattle Allotment.
T64N, R3W, Sec. 5 and 6. Orange and meadow hawkweed, thistle, perimeter encompasses approximately 6 acres. Site occurs within cattle allotment. Cow Creek drainage was severely burned over during the Trapper Creek fire. Much of the drainage is open and vulnerable to noxious weed invasion. The drainage is noted for the presence of fens and sensitive plants.

Site #9. Saddle Pass North Road #2455 and Silver Creek Road 1007.
T65N, R3W, Sec. 9-11, 14, 15, 21, and 22. Meadow hawkweed, perimeter encompasses approximately 17 acres, while the net acreage measures approximately 4.5 acres. Site occurs along road right-of-way.

Site #10 Saddle Pass Harvest units.
T65N, R3W, Sec. 10 and 15. Meadow hawkweed, perimeter encompasses approximately 20 acres, while the net acre measures approximately 2.25 acres. Site occurs in timber harvest units near the U.S./Canadian border.

Site #11. Grass Creek Road #636.
T65N, R3W, Sec. 7 and 8; T65N, R4W, Sec. 12-14, 23, 26, 27, 34; T64N, R4W, Sec. 3 and 4. Meadow hawkweed, perimeter encompasses approximately 19.9 acres, while the net acreage measures approximately 3 acres. Site occurs along road right-of-way on the main road in Grass Creek. The Grass Creek drainage is associated with the Grass Creek cattle allotment. There are several sensitive plant species in this drainage.

Site #12. Grass Creek Gravel Pit
T64N, R4W, Sec. 9. Meadow hawkweed, perimeter of the infestation encompasses approximately 2 acres. Site occurs within a gravel pit and the population density of the invader species is very concentrated.

Site #13. Bog Creek
T65N, R4W, Sec. 9, 16, 17. Meadow hawkweed, perimeter of the infestation encompasses approximately 1.5 acres. A concentrated population occurs at the site.

Site #14. Boundary Creek Road #2450.
T65N, R2W, Sec. 17 and 18; T65N R3W, Sec. 13. Spotted knapweed, meadow hawkweed, perimeter of the infestation encompasses approximately 3.9 acres. Site occurs along Boundary Creek Road.

Site #15. Lower and Upper Italian Roads and Harvest Units.

T65N, R2W, Sec. 15, 21, and 22. Meadow hawkweed, perimeter of the infestation encompasses approximately 12.1 acres. Site occurs within timber harvest units and along access roads.

Purcell Trench - Valley Sites

Site #16. Stampede skeleton weed site.
T60N, R1W, Sec. 12. Skeleton weed, dalmation toadflax, meadow hawkweed, perimeter of the infestation encompasses approximately 12 acres. Site is associated with BPA powerline right-of-way and dry site meadows.

Site #17a. BPA powerline south.
T60N, R1W, Sec. 14, heavy infestation of dalmation toadflax and spotted knapweed, perimeter of proposed treatment area encompasses approximately 2.4 acres. Site occurs along BPA powerline and is used for motorcycle and ATV recreation. Treatment site is a source of weeds to adjacent trails system.

Site #17b. Motor bike access.
T60N, R1W, Sec. 14, spotted knapweed, perimeter of the infestation encompasses approximately 2.4 acres. Site occurs along a new access for motorbikes and ATV's.

Cabinet Mountain Ecosystem

Site #18. Katka, Roads #314, #2209, #2207,and #2662
T62N, R2E, Sec. 36: T62N, R3E, Sec. 31; T61N, R3E, Sec. 5, 6, 8, 9,15, 15, 21, 22, 28, 29, and 32. Spotted knapweed, hawkweed, and tansy, perimeter of the infestation encompasses approximately 24.7 acres. Site occurs along road right-of-way.

Site #19. Boulder Creek Road #408.
T61N, R3E, Sec. 31 and 32, hawkweed and common tansy, perimeter of the infestation encompasses approximately 2.9 acres. Site occurs along road right-of-way.

Site #20. Boulder Meadows.
T60N, R3E, Sec. 20 and 21. Meadow hawkweed, perimeter of the infestation encompasses approximately 1.5 acres. Site occurs within a meadow identified as unique grizzly bear habitat.

Site #21. Black Mountain, Road #274.
T61N, R2E, Sec. 31; T60N, R2E, Sec. 5 and 6, meadow hawkweed and common tansy, perimeter of the infestation encompasses approximately 6.3 acres. Site occurs road right-of-way.

Site #22. Twenty Mile Road #408 West.
T60N, R1E, Sec. 1, 12; T60N, R2E, Sec 7. Meadow hawkweed and common tansy, perimeter of the infestation encompasses approximately 2.4 acres. Site occurs along road right-of-way.

Site #23. Cabin Creek Road
T61N, R2E, Sec. 8, 17, 18. Meadow hawkweed, knapweed, perimeter of the infestation encompasses approximately 3.6 acres. Site occurs along road right-of-way.

Purcell Mountain Ecosystem

Site #24. Meadow Creek Roads ##229, #211, and Campground access road.
T62N, R2E, Sec. 8; T63N, R2E, Sec. 2, 11-15, 20, 24, & 32. Meadow hawkweed and spotted knapweed, perimeter encompasses 17 acres, while net acres measure approximately 1.5 acres.

Site #25. Sinclair Lake Area.
T64N, R2E, Sec. 3 and 10. Meadow hawkweed and spotted knapweed, perimeter encompasses approximately 3.2 of an acre, while net acres measure approximately 0.5 of an acre. Site occurs adjacent to the Moyie River and Sinclair Lake near a day use facility and a proposed interpretive site.

Site #26. Brush Lake campground and day use access roads.
T64N, R1E, Sec. 9, 15, 16, 21, and 22. Meadow hawkweed and common tansy, perimeter encompasses approximately 6.8 acres, net acres are approximately 1 acre. Treatment area is primarily along road right-of-way.

Site #27. Robinson Lake
T65N, R2E, Sec. 21. Meadow hawkweed, and common tansy, perimeter encompasses approximately 5.3 acres, while the net acres measure approximately 0.5 of an acre. Site occurs along access roads to the campground and the boat launch.

Site #28a. Copper Creek Campground Access
T65N, R2E, Sec. 14. Spotted knapweed, perimeter encompasses approximately 3.4 acres, while the net acre measures approximately 0.25 of an acre. Site occurs along the Copper Creek road.

Site #28b. Copper Creek roads #2509 and #2511
T64N, R2E, Sec. 1 and 2; T65N, R2E, Sec. 24, 25, and 36; T65N, R3E, Sec. 30 and 31. Canada thistle, spotted kanpweed, and meadow hawkweed, perimeter encompasses approximately 14.5 acres, while the net acres measure approximately 12 acres. Site occurs along roads and in timber harvest units along roads.

Site #29. Smith Lake and campground access.
T63N, R2E, Sec 30. Spotted knapweeed, common tansy, perimeter encompasses approximately 1 acre, while net acres measure approximately 0.05 acres. Site occurs around the Smith Lake Campground.

SCOPE OF THE ANALYSIS: CONNECTED, CUMULATIVE, AND SIMILAR ACTIONS

In the preparation of an EIS, a recurring issue is the extent or scope of the analysis required for a proposal. Regulations contained in 40 CFR 1508.25 address the scope of the analysis and outline several elements to be considered in the analysis of the proposed action.

These regulations recognize that separate activities can combine and interact to increase impacts significantly beyond the effects of individual actions. For example, it is possible that the herbicide runoff from one spray site would not harm aquatic organisms; however, when combined with runoff from other sites the total impact could be significant. As explained in 40 CFR 1508.25, these actions would be ***cumulative***, and their cumulative impacts must be addressed. The possibility of cumulative impacts to valuable resources, such as water, human health, and wildlife is one reason these 41 sites are considered in a single EIS.

The regulations governing the scope of an EIS (40 CFR 1508.25) also refers to the combined analysis of ***connected*** actions. For example, if a road were being built to access a timber harvest, then the road construction would be connected to the harvest. Timber harvest would not be possible in the absence of the road construction, and the rationale for road construction would be diminished in the absence of the timber harvest. Thus, the effects of these connected actions would be analyzed together.

The actions proposed here are part of a larger program of noxious weed control on the Bonners Ferry Ranger District. This program includes monitoring and mapping of infestation sites, public education efforts, cleaning of equipment in certain situations, restoring disturbed areas that might otherwise facilitate the establishment of exotic species, and other activities.

The negative environmental impacts of these other program activities is small, and their primary effect is to forestall the types of activities proposed in this EIS. Therefore, discussion of these other control activities is limited in this EIS, except when an alternative calls for greatly expanding the activity.

The regulations in 40 CFR 1508.25 provide for the combined evaluation of ***similar*** actions that are reasonably foreseeable, such as those that share a common timing or geography. For example, it is possible that new noxious weed establishments may occur within the areas analyzed in this EIS. Prior to conducting additional control projects, the impacts of previous control projects will be considered.

SCOPE OF THE ANALYSIS: ALTERNATIVES

In determining the scope of the analysis, the Forest Service must consider three types of alternatives (40 CFR 1508.25(b)): the no-action alternative, other reasonable courses of action, and mitigation

measures not included in the proposed action. Chapter 2 considers possible alternatives for controlling weeds. Alternatives that have a reasonable likelihood of at least partial success are discussed in detail. A range of mitigation measures are also discussed for the alternatives. The impacts of the no-action alternative, as well as other alternatives, are discussed in the following chapters.

SCOPE OF THE ANALYSIS: IMPACTS

Regulations contained in 40 CFR 1508.25(c) require that an EIS analyze three types of impacts: direct, indirect, and cumulative. Cumulative effects are described above in the discussion on cumulative actions.

Direct effects are caused by the action and occur at the same time and place as the proposed action. For example, direct effects of herbicide application could include impacts on some non-target native plant species. Indirect effects caused by the action occur later in time or are removed in place. For instance, with the spread of noxious weeds, it might be reasonable to predict a change in vegetative composition with an eventual impact on native plant diversity. These and other reasonably foreseeable direct, indirect, and cumulative impacts are analyzed in Chapter 4.

SCOPE OF THE ANALYSIS: DECISIONS

Proposals of this nature within National Forest Systems involves two levels of decisions.

The first level is the development of a Forest Plan that guides all resource management programs, practices, uses, and protection measures. The Idaho Panhandle National Forest Plan, the Forest Plan Final EIS, and the Record of Decision which were all published in 1987, consist of both forest-wide and area-specific standards and guidelines that provide for land uses under a given set of management constraints. For example, the Forest Plan provides the objective of noxious weed control based on integrated pest management conducted in cooperation with counties, other agencies, and private landowners.

The second level occurs during the Forest Plan implementation. This level involves the analysis and implementation of management practices designed to achieve the goals and objectives of the Forest Plan.

This EIS documents the analysis for a second level decision concerning the control of noxious weeds on Bonners Ferry Ranger District. The proposed action is not a general management plan. If the decisionmaker selects an action alternative, the activities will be implemented as soon as possible, and will most likely begin in late spring of 1996.

WEED MANAGEMENT PHILOSOPHY

As noted in the previous section on "scope of the decisions", there are two levels of decisions involved in planning activities on National Forest Systems Lands. The first level is the Forest Plan, which provides direction and standards for all resource management. During this planning process, the Idaho Panhandle National Forests decided to use IPM (Integrated Pest Managment) principles in managing various pests. This decision derives from the regulations that implement the National Forest Management Act of 1976 (36 CFR 219.27 (3)) and calls for the use of IPM when dealing with forest pests. Because the decision to implement an IPM program has already been made, it need not be revisited in this document.

The second level of decision involves implementing the directions provided from the first decision level. In the present example, then, we must implement projects consistent with a policy or program of Integrated Pest Management. Implementation is made more difficult because there is no standard definition of IPM (see, for example, several articles in the *Journal of Pesticide Reform*, winter 1989 issue). The Forest Service handbook on Forest Service Pest Management (FSH 3409.11, 6/86) gives the following definition of IPM:

A decisionmaking and action process incorporating biological, economic, and environmental

evaluation of pest-host systems to manage pest populations.

A variety of activities could be carried out under an IPM program. Although some people consider IPM to be an absolute alternative to pesticide application, in reality, IPM provides a full range of management alternatives. Many of these alternatives are non-controversal and have minimal adverse environmental impact. For example, inventory and monitoring activities, public education, and pulling of small weed infestations are all important phases in pursuing an IPM program on the Idaho Panhandle National Forests. The inventory results gathered on the Bonners Ferry Ranger District have been shared with the public during the scoping process. In addition, public education efforts are emphasized and are currently being expanded. These parts of an IPM program typically do not require extensive analysis in an environmental document such as this EIS.

As the Forest Service implements control projects on specific sites, the agency must choose specific treatment methods. Some of the treatments, such as pesticide application, may have potential adverse impacts that must be considered in the selection process. The analysis of potential adverse effects is provided in an environmental document such as this EIS. NEPA regulations also require that this EIS consider a full range of treatment alternatives consistent with an IPM program.

An IPM program also requires that the Forest prioritize treatment activities. The overall Forest strategy is to contain weeds in currently infested areas and to prevent the spread of weeds to susceptible but generally uninfested areas. The Forest also attempts to eradicate small infestations in generally uninfested areas. The Forest has had a weed management strategy in place since 1989 when the Fianl EIS, *Weed Pest Management, Idaho Panhandle National Forests*
was completed. This guiding strategy reference is included in this document as Appendix F.

Currently the largest area on the Bonners Ferry Ranger District as well as the Idaho Panhandle National Forest that has limited populations of noxious weeds is the Selkirk Mountain Ecosystem and portions of the Cabinet Mountain Ecosystem. However, within these ecosystems, there are a number of open, grassy meadows and riparian and wetland habitats that would provide excellent weed habitat even with no site disturbance. The challenge of an IPM program for noxious weeds is to keep these areas weed free.

Under an IPM program, prevention strategies are commonly recognized as the best way to avoid the impacts of noxious weeds and the need for more costly treatment at a later date. Prevention of weed spread to these uninfested areas is an important aspect of our ecosystem management. Prevention measures could include the promotion of weed-free forage by all back-country users. The Forest Service will be requiring weed-free forage in other back-country areas.

An emphasis on the use of weed-free forage is not intended to ignore other sources for the spread of weeds. Many drainages are accessed by Forest Service and County roads, most open at least a portion of the year, if not year round. Vehicles carrying noxious weed seeds from infested areas to uninfested areas can and do contribute to the spread of weeds.

FUTURE ACTIVITIES

As noted in the introductory sections of this chapter, District personnel have conducted extensive reconnaissance, monitoring, mapping, and other data collection efforts to determine the extent of weed infestation on the Bonners Ferry Ranger District. Several conclusions can be reached from these efforts.

The control of species such as hawkweed on the Bonners Ferry Ranger District in the Selkirk and Cabinet Mountain Ecosystems are reaching the "now or never" stage. The extent of infestation of meadow hawkweed on some of the other districts on the Idaho Panhandle National Forests is a case in point. When the size of infestation exceeds several hundred acres, eradication and even control becomes unfeasible because of logistic, financial, and environmental constraints.

An aggressive control program can reduce the infestation of weeds in the Selkirk and Cabinet Mountain Ecosystems. On successive years treatment needs should be reduced as weeds are eradicated or reduced on individual sites.

In future years it is possible that new infestations of weeds will be discovered. Many of these may be small enough to control manually. However, others may require more aggressive treatment. As a worst case, this EIS assumes that the infestation acreage and treatment increases by 20 percent over current levels.

FUTURE ACTIVITIES

CHAPTER II
ALTERNATIVES

INTRODUCTION

This chapter:

1. describes the internal scoping and the public involvement process used to develop the alternatives,

2. identifies the environmental issues and concerns,

3. describes and compares the alternatives,

4. identifies monitoring proposals.

ALTERNATIVE DEVELOPMENT PROCESS

INTERNAL SCOPING AND PUBLIC INVOLVEMENT

The public has been involved throughout the development of the EIS. Public comment has helped define the issues and develop the range of alternatives for accomplishing management goals and objectives.

Public comment was solicited formally with a notice published in the *Federal Register* that indicated our intent to prepare an EIS. Several articles published and news features in local newspapers solicited public input on the weeds in the Forest issue. The project file contains copies of these articles. In addition, meetings were held on a one-on-one basis with interested individuals.

It is apparent that control of exotic species is an important issue with many segments of the public. The Forest Service is but one of many agencies and organizations with an interest in controlling the impacts of these species.

ISSUES

Analysis of public and internal input resulted in the following list of issues that guided the development of the alternatives. Each issue is stated as a question, often general in nature, and is followed by a synopsis of the specific comments received from the public. A brief discussion of how the issue is addressed in the EIS follows the synopsis of public comments.

1. What are the potential impacts of noxious weeds on resources such as ecological communities and processes; threatened, endangered, or sensitive plants and animals; soils; water quality; aesthetics; wildlife and fish; and recreational opportunities?

Most commenters viewed noxious weeds as a potential problem in the National Forests. Many have seen the impacts of non-native plants on vast areas. . One commenter questioned our use of the terms "native" and "noxious" species.

The Environmental Consequences section of this EIS (Chapter 4) discusses the impacts of noxious weeds on various resources.

2. What are the potential impacts of weed control methods on other forest resources as listed in issue 1?

Although most commenters acknowledge the potential threat of noxious weeds, some question whether the use of herbicides in the Forest would be appropriate. Some commenters were concerned about the impact of herbicides on the biological resources. Others advocated a full range of control measures, including herbicide use, to reduce the threat.

A full range of alternatives is developed in this chapter, and the environmental, social, and economic consequences of the alternatives are presented in Chapter 4.

3. How would the weed management methods, particularly herbicide application, affect human health?

Some commenters were specifically concerned about the impact of herbicide spraying on human health and on traditional hunting and gathering activities.

The potential impacts of herbicide application on human health have been analyzed extensively. Chapter 4 presents the results of this analysis.

ALTERNATIVES CONSIDERED IN DETAIL

BRIEF OVERVIEW

Four alternatives were developed to address the issues raised by public and agency comment. These alternatives represent the range of control methods currently available for treatment of noxious weeds. In addition to the No Action alternative, two of the action alternatives involve only non-chemical methods of control. The comparison of these alternatives with the alternative that includes chemical use sharply defines the issue of possible human health and environmental impacts of herbicide use. The analysis of the No Action alternative addresses the impacts of the unchecked expansion of noxious weeds in the Forest.

The four alternatives are outlined below with a brief discussion of the major issues relevant to these alternatives. Each of these alternatives, except the No Action alternative, involve a combination of treatment methods. These treatment methods are discussed in greater detail in the following sections.

MONITORING AND MITIGATION FEATURES COMMON TO MORE THAN ONE ACTIONALTERNATIVE

If a decision is made to apply herbicides, all chemical applications would be conducted in accordance with label instructions. In addition, no spray applications would be made when the wind speed exceeds 8 mph. All applications would be directed by an applicator certified in accordance with U.S. EPA and State of Idaho standards. All applications would be made with ground based equipment including truck mounted sprayers and backpack sprayers. Information on spills, spill avoidance, and the handling of pesticides (including herbicides) is contained in Appendices C and D. Compliance with these provisions would ensure that pesticides are applied in accordance with State of Idaho Best Management Practices for pesticide use.

Post-spray vegetation monitoring would be conducted on representative sites. Monitoring sites would be selected prior to treatment, then reviewed yearly.

ALTERNATIVE 1: No Action

This alternative would result in a change in the current noxious weed control activities on the Bonners Ferry Ranger District. Control activities would be restricted to minimal amounts of manual control.

The comparison of this alternative with the active control alternatives highlights the potential effects of uncontrolled weeds on the forest environment. The No Action alternative also provides a baseline for analyzing the possible adverse impacts of the control alternatives.

ALTERNATIVE 2: Manual and Cultural Control

This alternative was developed in response to the possible impacts of treatment methods, such as chemical control, on non-target plants, and human health. Under this alternative, treatments such as hand pulling, clipping, and mowing would be implemented to destroy or limit reproduction of the weed species. Cost effectiveness and environmental/ human health trade-offs can be compared between this alternative and other proposed alternatives.

ALTERNATIVE 3: Manual, Cultural and Biological Control

This alternative was developed in response to many of the same issues that prompted the development of Alternative 2. Under this alternative, treatments previously mentioned under Alternative 2 would be supplemented with the release of biological agents such as parasites, predators and pathogens that

have shown some promise in reducing weed infestations. This alternative allows us to examine the possible impacts of introducing species that show some promise in bringing exotic plant species into better balance in these ecosystems. At the present time relatively few biological control agents are available that are effective against the weed species of concern here. However, some agents have shown promise in controlling Canada thistle. Cost effectiveness and environmental trade-offs between this alternative and other alternatives can be examined.

ALTERNATIVE 4: Manual, Cultural, Biological and Chemical Control

Under this alternative a full range of treatments would be considered for each site. Herbicide prescriptions would be consistent with or more restrictive than product label requirements. If an herbicide is used in the annual floodplain, the Forest Service would only apply a herbicide formulation approved by the U.S. Environmental Protection Agency for direct applications to water. In no case would the Forest Service apply herbicide directly to water.

Under this alternative approximately 174 pounds of 2,4-D, 23 pounds of dicamba, 12 pounds of clopyralid, and 46 pounds of picloram would be applied to project areas identified for treatment with herbicides.

This alternative allows us to compare the cost and effectiveness of the chemical use with the potential environmental and health effects of this and other methods.

METHODS AND PRACTICES AVAILABLE UNDER EACH ALTERNATIVE

The following section describes the control methods available under the alternatives reviewed in the previous section.

Manual Control:

Manual control methods range from hand pulling and grubbing with hand tools to clipping or cutting the plants with scythes or other cutters. If sufficient root mass is removed, the individual plant can be destroyed. Cutting the plants will reduce reproduction of perennial plants and weaken its competitive advantage by depleting carbohydrate reserves in the root systems.

Cultural Control:

Cultural control generally involves manipulating a site to increase the competitive advantage of desirable species and decrease the competitive advantage of undesirable species. Manipulations could involve transplanting native plants to shade out weedy species or covering weed-seed contaminated soil with a layer of uncontaminated soil. Seeding grass species and applying fertilizer on site where ground cover is sparse could help to culturally control weeds.

Biological Control:

Biological control is the use of biotic agents to attack undesirable plant species. Populations of native species are generally limited in part by herbivorous and pathogenic organisms as well as by competition for nutrients and moisture. Non-native vegetation has had a dramatic impact in many parts of the West because it has been introduced without biological control agents present. The introduction of these control agents is viewed by most experts as the best long-term solution to the noxious weed problem where there are large, widespread populations of a given species.

Currently, two biocontrol agents, *Urophora affinis* and *Urophora quadrifasciatus*, are present in some knapweed infestations on the district. In sufficient concentrations these seedhead flies can reduce seed production by 50 to 90 percent. However, knapweed is such a prolific seed producer that these organisms have had no effect on the density of the infestations and little effect on its rate of spread.

Several biological agents are currently being introduced into the United States for the control of Canada thistle. *Ceutorhynchus litura* is a stem mining weevil which attacks the young Canada thistle plants in early spring. The stem mining larvae internally attack the elongating stem in early summer. As the larvae develop they begin to create numerous exit holes near the root crown leaving the plant susceptible to a variety of plant pathogens. Under ideal circumstances (soil, size of infestation, climate etc.) population densities may be reduced up to 90 percent depending on the number of weevils released at the infestation (Rees, 1992).

Urophora cardui is a stem and shoot gall fly which attacks Canada thistle. Adults deposit their eggs on the axil of the stem in early summer. As the larvae develop they burrow into the stem creating a walnut size bowl or gall. The gall formation diverts the normal nutrient translocation away from the metobolic and reproductive systems of the plant. As a result flowers develop abnormally, and seed production is reduced.

Climatic and habitat conditions are expected to play a major role in the success of biological control agents. The adaption of these biocontrol organisms to the habitats currently infested by Canada thistle remains an unknown.

Chrysolina quadrigemina is a defoliating beetle which attacks St. Johnswort or goatweed. This defoliating beetle has successfully reduced the density of this weed in locations where fall temperatures are mild and the rainfall is abundant. There have been introductions of this beetle annually on the Bonners Ferry Ranger District since 1990. The beetle is thriving and is found at several locations on the district. There is evidence of St. Johnswort populations suffering the effects of defoliation by this beetle.

It should be noted that biological control agents will not completely eradicate a noxious weed infestation. Rather, a biological control strategy would allow the weed species to spread, though at lower density, through all suitable habitats in the forest.

Chemical Control

Four herbicides, 2,4-D, dicamba, clopyralid, and picloram, were considered for application on various sites. Three chemicals were approved for use in the 1989 IPNF Weed Pest Management EIS (2,4-D, glyphosate, and picloram). 2,4-D is a herbicide with very little persistence in the environment. @,4-D has several formulations, some of the common brand names include, Weed-B-Gon, HiDep, and Solution. The herbicide has low toxicity to aquatic species and several formulations are approved for use in water and near water. At application rates of 1 to 1.5 pounds per acre 2,4-D exhibits good control of knapweed with repeat applications and moderate control of goatweed, houndstongue, sulfur cinquefoil, and Canada thistle.

Dicamba (the active ingredient in Banville) is a broadleaf herbicide that is readily absorbed by leaves and roots and is concentrated in the metabolically active parts of the plants. Dicamba is effective against a similar range of weed species as 2,4-D at similar application rates. However, dicamba is somewhat more persistent than the 2,4-D herbicide and thus provides somewhat longer control of susceptible species.

Picloram (the active ingredient in Tordon) controls a variety of broad-leaved weed species, including all the weeds species of concern here. Picloram is generally applied at rates of one-quarter to one-half pound per acre. However, picloram's combination of mobility and persistence have generated concern over possible ground-water contamination. Possible environmental impacts are compared between this method and the other chemical and non-chemical control methods.

Clopyralid is a relatively new herbicide that is very selective and is toxic to some members of only three plant families: the composites, the legumes, and the buckwheats. Clopyralid is the active ingredient in Transline, and along with 2,4-D, is one of two active ingredients in Curtail. At application rates of one-quarter to one-half pound per acre, clopyralid is very effective against knapweed, the hawkweeds, and Canada thistle. However, it does not control any of the other weed species of concern. Clopyralid is more persistent than 2,4-D and dicamba, but less persistent than picloram.

The selective nature of clopyralid make it an attractive alternative on sites with non-target species that are sensitive to the other herbicides. Clopyralid has soil-mobility characteristics comparable to picloram, so the possibility of ground-water impacts must be addressed.

Control with a combination of chemical and non-chemical control

Site conditions such as vegetation types, soil types, and infestation levels vary significantly on some sites under consideration in this EIS. Therefore a combination of chemical and non-chemical methods may be selected for some sites. The selection of a herbicide alternative for a site would not prevent the application of manual methods either concurrently, or as a follow-up treatments, on remnant weeds on a site.

Control with mixtures of the herbicide Picloram and 2,4-D

Some control specialists treat several noxious weed species with mixtures of 2,4-D and picloram. Use of

a mixture is done to reduce the quantity of the picloram to half of what is normally applied, thus reducing the amount of effects on non-target species.

ALTERNATIVES CONSIDERED BUT NOT GIVEN DETAILED STUDY

Glyphosate Control

Glyphosate is a non-selective, broad-spectrum herbicide that is absorbed by leaves and translocated throughout the plant. Glyphosate has little soil activity and its absorption by roots is minimal to non-existent.

Due to its non-selectivity, it tends to eliminate both desirable and undesirable vegetation. Even if desirable vegetation is reseeded, hawkweed and other noxious weeds maintain their competitive advantage. In general, noxious weeds are aggressive pioneer species that are well adapted to disturbance. For example, knapweed seed can remain viable for over 10 years in the soil, and this seedbank provides a ready source for reinfestation.

Control with grazing

Grazing by sheep and goats provides another non-chemical alternative of control that may be applicable to large infestations of some noxious weed species. However, given the small, scattered nature of these infestation and their isolated locations, control through grazing becomes quite unfeasible. Grazing is relatively ineffective as a control technique on small infestations. Many plants would be skipped in these small or scattered infestations, thus requiring some followup treatment. Grazing can be used appropriately in areas with large infestations on commodity-production lands where some economic return can be gained on land that would otherwise be unproductive.

Control of Other Exotic Species

The Forest Service acknowledges that other exotic species exist within the Forest. Dominant species include: *Dactylis glomerata* (Orchard grass), *Phleum pratense* (Common timothy), *Poa pratensis* (Kentucky bluegrass) and *Trifolium spp.* (Clover). Many of these were intentionally introduced by seeding activities for erosion control. These species generally inhabit small areas. Under ideal circumstances these species would not be present in the Forest. Fortunately, these species are relativley non-aggressive and grazing by wild ungulates and domestic livestock has suppressed them. Eradication of these non-native species would require intensive soil disturbance practices frequently seen in farming communities across the West. The Forest Service will continue efforts to keep these species from spreading. These efforts include, for example, revegetating disturbed areas with appropriate native species to reduce the potential impact of non-native species when feasible.

TREATMENT METHODS CONSIDERED FOR EACH SITE

Table 2-1 lists the alternatives considered for each site. A number of sites were divided into two to four sub-sites, labelled A, B, C and D. Sites were subdivided where characteristics such as variation in treatment needs, type of infestation, soil type, or other factors varied across the site and affected the control prescription. Application of picloram and clopyralid was not considered for sites or sub-sites where label requirements for depth to ground-water and soil type could not be met.

Biological control was considered only for Canada thistle and St.John's wart (goatweed), because of the unavailability of effective biological control agents for other weed species at this time. Burning was only considered for sites that were surrounded by water and where the native vegetation was sufficiently sparse that it would not be burned when treating the target species.

RATIONALE FOR THE SELECTION OF THE PREFERRED CONTROL METHOD(S)

In the preferred alternative, the Forest Service has attempted to design the most effective program possible within the environmental, economic, legislative, and regulatory constraints governing the management of National Forest lands. As indicated in the introduction, a principal goal of the Forest Service is to protect the biological integrity of the Selkirk and Cabinet Mountain Ecosystems by controlling aggressive non-native species. The Forest Service is not interested in conducting projects that only give the illusion of control. Furthermore if these control projects and this overall program cannot be demonstrated to protect biological integrity in these

	Site No	Site	Man	Bio	2,4-D	Dicamb/Clop	Picl and 2,4-D	Mileage/acres	Weed Species Treated	Proximity to water
1	1a	Snow Cr A Rd 402	~	~	~	P	X	7.5 m/18.2ac	Hawkweed, tansy, knapweed, road row	Mostly greater than 300′
2	1b	Snow Cr B Rd 1007	~	~	~	X	P	2 mi/4.8 ac	Hawkweed; along road row	Greater than 300′
3	1c	Snow Cr C Caribou Pass	~	~	~	~	P	.3 mi/.73 ac	Hawkweed; along road row	Greater than 300 ′
4	1d	Snow Cr D Rd 2646A		~	~	P	X	3 mi/7.3 ac	Hawkweed, common tansy; road row	Greater than 300′
5	1e	Snow Cr E d 2667	X	~	~	P	~	.1 mi/.24 ac	Common tansy; small patch near road	Greater than 300′
6	2a	Myrtle Cr A Rd 2411&633	~	~	~	X	P	3 mi/7.3 ac	Knapweed; along road row	Greater than 300′
7	2b	Myrtle Cr B Mid Rd 633	X	~	X	P	X	2.8 mi/6.7 ac	Hawkweed, tansy; along road row	Mostly greater than 300′
8	2c	Mrytle Cr C Upper Rd 633	X	~	~	~	P	.2 mi/.48 ac	Hawkweed; along road row	Mostly greater than 300′
9	3a	Ball Cr A Rd 432	~	~	~	~	P	2.6 mi/6.3 ac	Hawkweed, knapweed; along road row	Greater than 200′
10	3b	Ball Cr B Rds 432 & 2411	~	~	~	P	~	4 mi/9.6 ac	Hawkweed, tansy; along road row	Mostly greater than 200′
11	4	Trout Cr Rd 634	~	~	~	~	P	5.4 mi/13.1ac	Hawkweed, knapweed; along road row	Greater than 300′
12	5	Lower Trout Cr cow allot	~	~	P	P	X	8 ac	Hawkweed; continous in places	Within 100′
13	6	Parker Cr trails 14&221	~	~	~	~	P	.9 ac	Hawkweed, knapweed; along 1st 1.2 m	Greater than 300′
14	7	Long Canyon Cr Trail	~	~	~	P	~	.5 ac	Hawkweed, tansy; along 1st .5 mi	Greater than 300′
15	8a	Smith Cr A Lower Rd 281	~	~	~	~	P	4 mi/9.6 ac	Hawkweed, knapweed; along road row	Greater than 300′
16	8b	Dead Cow, Beaver, Saddle	~	~	~	~	P	13.8 mi/33 ac	Hawkweed; along road row	Mostly greater than 200′
17	8c	Upper Smith Cr Rd	~	~	~	~	P	7 mi/17 ac	Hawkweed; along road row&meadows	Mostly greater than 300′
18	8d	Upper Cow Cr	~	~	~	P	X	6 ac	Hawkweed; in meadows	Mostly greater than 300′
19	9	Saddle/Boundary Roads	~	~	~	~	P	7 mi/17 ac	Hawkweed; along road row	Greater than 200′
20	10	Saddle Cr harvest units	~	~	~	X	P	20 ac	Hawkweed; sporadic thru units	Greater than 100′
21	11	Grass Cr Rd 636	~	~	P	~	P	8.2 mi/19.9 a	Hawkweed; along road row	Mostly greater than 100′
22	12	Grass Cr Gravel Pit	~	~	~	~	P	2 ac	Hawkweed; sporadic	Greater than 300′
23	13	Bog Cr	~	~	~	~	P	1.5 ac	Hawkweed; sporadic	Greater than 200′
24	14	Boundary Cr Rd 2450	~	~	~	~	P	1.6 mi/3.9 ac	Hawkweed; along road row	Greater than 200′
25	15	Italian Rd 282 and 2450	~	~	~	P	X	5 mi/12.1 ac	Hawkweed; along road row	Greater than 300′
26	16	Stampede Skeleton Weed	~	~	~	~	P	12 ac	Skeleton, Toadflax; scattered	Greater than 300′
27	17a	Stampede A BPA Powerline	~	~	~	~	P	1 mi/2.4 ac	Several; along access road	Greater than 300′
28	17b	Stampede B Motorbike tr	~	~	~	~	P	1 mi/2.4 ac	Several; along motorbike trails	Greater than 300′
29	~	~	~	~	~	~	~	~	~	~
30	18	Katka Rds 314/2209/2207	~	~	~	X	P	10.2 mi/24.7	Several; along road row	Mostly greater than 300′
31	19	Boulder Rd 408, 628	~	~	~	~	P	1.2 mi/2.9 ac	Several; road row	Mostly greater than 300′
32	20	Boulder Meadows	X	~	~	P	X	1.5 ac	Hawkweed; sporadic	Greater than 200′
33	21	Black Mountain Rd 274/408	~	~	~	P	X	2.6 mi/6.3 ac	Hawkweed, tansy; along road row	Greater than 300′
34	22	Twentymile Rd 408	~	~	~	P	X	1.0 mi/2.4 ac	Tansy, Hawkweed; along road row	Greater than 300′
35	23	Cabin Cr	~	~	~	~	P	1.5 mi/3.6 ac	Hawkweed, knapweed; along road row	Greater than 200′
36	~	~	~	~	~	~	~	~	~	~
37	24	Meadow Cr roads and CG		~	~	X	P	7 mi/17 ac	Several; along roads and in CG	Greater than 200′
38	25	Sinclair Lake Access Rds	~	~	~	P	~	1.3 mi/3.2 ac	Hawkweed, knapweed; along road row	Greater than 100′
39	26	Brush Lake Access	~	~	~	X	P	2.8 mi/6.8 ac	Hawkweed, tansy; along roads	Greater than 300′
40	27	Robinson Lake CG & roads	~	~	~	P	~	2.2 mi/5.3 ac	Hawkweed, tansy; roads & CG	Mostly greater than 100′
41	28a	Copper Cr A CG Access Rd	~	~	~	P	~	1.4 mi/3.4 ac	S.Knapweed; along access roads	Greater than 200′

	Site No	Site	Man	Bio	2,4-D	Dicamb/Clop	Picl and 2,4-D	Mileage/acres	Weed Species Treated	Proximity to water
42	28b	Copper Creek B Rds 2509	~	P	P	~	P	6 mi/14.5 ac	C.Thistle, S.Knapweed, Hawkweed	Greater than 300'
43		& 2511	~	~	~	~	~	~	along roads and in clearcuts	~
44	~	~	~	~	~	~	~	~	~	~
45	~	~	~	~	~	~	~	~	~	~

ecosystems, the FS does not intend to undertake them or to continue them once undertaken.

When presenting the preferred alternative it is appropriate to explain the rationale used in selecting the preferred methods for treatment sites. Any selection involves a series of tradeoffs. We will attempt to explain how we made these tradeoff's in designing the preferred alternative.

It is clear that our program of controlling non-native species in the Selkirk and Cabinet Mountain ecosystems has been successful to date. Where the existing program has targeted control, the district has worked aggressively to limit the spread of noxious weeds. The 1989 EIS targeted areas in the Selkirks to a greater extent than other areas on the district. When compared to the Selkirk Mountain ecosystem, the population of noxious weeds in the Purcell Ecosystem is at least 100 fold greater. There are three other reasons why the Selkirk ecosystem has far fewer noxious weeds as compared to the Purcell Mountain ecosystem. One is that the Selkirk Crest probably acts as a barrier to wind born seeds, thus drastically limiting an invasion to the eastside of the Selkirks even though the prevailing winds in the area are from the southwest. A lack of roads connecting east to west is also a consideration. Secondly, funding was limited, and the district placed a higher priority on treating weeds invading the Selkirks. Thirdly, there are several adjacent landowners on the west side of the Selkirks that have large farms and have effective weed control programs on there own land.

The difficult decision now facing the Forest Service is the direction to take the noxious weed program. Although 4 alternatives are examined in this EIS in order to elaborate the decision space, there seem to be, in reality, only two basic choices. The first is to call off the effort to control these exotic species. Included in this first option are alternatives that are tantamount to calling off the effort because we cannot expect the budget to implement fully the alternative (i.e., manual control) to contain the spread of weeds. The second option is to implement an aggressive control effort including the use of herbicides not identified in the 1989 EIS.

The following sections of this Chapter and Chapter 4 discuss in greater detail the environmental consequences of a no action alternative and an aggressive control program relying in part on chemicals. The impacts of intermediate control alternatives are also discussed.

In the remainder of this section the selection of particular methods as part of a more aggressive program is discussed.

The preferred alternative, Alternative 4, includes the herbicide picloram. This herbicide is very effective against most of the weeds currently infesting this area. However, several concerns are frequently raised with picloram. It is relatively persistent in the environment; it can affect a number of non-target species; and it can move from the site of application in some soil types.

Moderate persistence is not in itself an undesirable property when combatting noxious weeds. All of the weed species of concern produce seeds which can remain viable for many years in the soil. Thus non-persistent herbicides must be reapplied very frequently in order to control the regular emergence of weed seedlings from the soil seed bank. Frequent reapplication of herbicides has the disadvantage of increasing human exposure as well as increasing off-site drift. Although these factors can be controlled they must be considered in our decision.

In order to minimize impacts to non-target species and the possibility of migration through the soil, the application of picloram is limited to sites with resistant native species and soils that prevent leaching. The amount of picloram applied can be reduced in half with the addition of 2,4-D, thereby reducing effects to non-target species. Clopyralid can be used where control of knapweed or hawkweed is desired while protecting sensitive non-target species. However, clopyralid is not effective against most other weed species and requires more frequent application to control knapweed and hawkweed. It also has similar soil mobility to picloram.

On sites with soils more prone to leaching, less persistent chemicals such as 2,4-D or dicamba can be used. Some formulations of 2,4-D have been approved by the U.S. EPA for application to the edge and even over water. Only 2,4-D would be applied in the annual flood plain (after water levels have receded). The rapid degradation of this compound (2 to 4 weeks) would ensure that no chemical is available in the following spring runoff.

Dicamba would be used in other areas beyond the annual flood plain where picloram and clopyralid cannot be used because of label restrictions and concerns about soil mobility. Dicamba is more persistent than 2,4-D and has the advantage of greater effectiveness against some species.

The goal of this program is to erradicate or control most of the noxious weed species from these ecosystems. A possible exception is Canada thistle. Canada thistle is established in many locations and is a difficult plant to control because of its rhizomatous root system and prolific seed production. The preferred alternative is based on a two-pronged approach to this weed. We would attempt to eliminate many of the small infestations while containing the larger infestations with biological control agents and perimeter applications of herbicide. In this manner we hope to keep this weed confined while determining the effectiveness of biological control.

MONITORING

Sampling methods enable the ready collection and computer storage of a variety of data on a particular site. Variables that can be recorded include the plant species, the percent of total vegetation, frequency of the species, and biomass of individual species.

Post-spray vegetation monitoring would be conducted on representative sites. Monitoring sites would be selected prior to treatment, then reviewed yearly. The effectiveness of treatment and its impact on non-target species would be monitored.

COMPARISON OF THE ALTERNATIVES CONSIDERED IN DETAIL

This section presents a comparison of alternatives by issue. This section also presents an estimate of the costs of the alternatives.

ISSUE 1: IMPACT OF NOXIOUS WEEDS ON RESOURCES

As documented in Chapter 4, noxious weeds can significantly impact the species diversity on infested sites. On heavily infested sites, aggressive species can comprise as much as 90 percent of the plant biomass. In addition, the elimination of some native species has been documented on such sites.

Knapweed, tansy, hawkweed, Canada thistle and the remaining species of concern could have devastating impacts on riparian zones, grassland and open forest habitat, critical components in these ecosystems. Once established on a site, particularly a sunny, dry site, knapweed quickly becomes dominant even in the absence of disturbance. As native species decrease, the forage available for various wildlife species is reduced. There has been little research to document decreases in wildlife populations with increasing noxious weed infestations. Such research is very difficult to conduct. Some wildlife species such as deer and elk can also shift grazing patterns, at least to a limited extent. It is certainly the case that use by big game animals has increased dramatically on some sites where noxious weeds have been treated (Thompson 1990).

The impact of noxious weeds on other resources under the various alternatives is directly related to the effectiveness of the alternatives in controlling the spread of the weed. The control effectiveness of the alternatives is reviewed briefly below.

The No Action alternative would allow noxious weeds to increase unchecked on these sites. It is very likely that the weeds would spread to new sites in the forest, as has already occurred on thousands of infested acres within the Purcell Mountain ecosystem. Knapweed is relatively brittle, which allows seedheads to break off and cling to folded rafts, manty packs, backpack frames, boot laces, animal hair, etc. Some weed species also spread vegetatively. Portions of roots and or mature seeds could eventually spread to the edge of unstable stream banks and be carried downstream to start new infestations. Under this alternative, the impacts of noxious weeds on other resources would increase as the size and number of infestations increased.

Alternative 2 relies solely on manual and cultural control. If conducted 2 or more times per year on each site, a diligent program of manual and cultural control could prevent seed production of weeds. However, some weed species could not be eradicated because of their extensive root system which allows continual resprouting. This control regimen would have to be repeated annually for an indefinite period.

With intensive manual and cultural control, the impacts of noxious weeds noted above, could be largely avoided. However, the difficulty of carrying out such an intensive control program should not be underestimated. Sufficient resources must be committed to carry out the program annually. If the site were left untreated for a year or two, noxious weeds could quickly reassert dominance. The chance of spread to new sites would again increase.

Alternative 3 combines biological control with manual and cultural control methods. Under this alternative biological control would replace manual control on most Canada thistle sites. Biological control could reduce the competitiveness of Canada thistle in these ecosystems. Biological agents *Ceutorhynchus litura* (Stem mining weevil) and *Urophora cardui* (gall fly) can reduce population density of Canada thistle up to 90 percent under ideal circumstances (Rees 1992). Biological control will not compeletely eradicate Canada thistle infestations. It is also not known whether these biological agents will establish under the climatic conditions of North Idaho.

Alternative 4 combines all available control methods. Application of the herbicides 2,4-D, dicamba, clopyralid, and picloram would be combined with manual, cultural and biological control. This alternative can effectively prevent the spread of exotic weeds and the resulting impacts discussed under the No Action alternative. Low persistent herbicides such as 2,4-D and dicamba may require repeated treatments in following years until the infestation sizes and densities are reduced. Since most of the moderately persistent herbicides would remain in the upper 4 to 6 inches of soil, some resprouting of plants could occur from deep roots, particularly in areas that are missed or lightly sprayed. Sites with mature weeds likely harbor large numbers of seeds that remain viable for many years. Followup treatment may be necessary as new seedlings emerge.

A major difference among the herbicides would be the frequency of respray. 2,4-D and dicamba are herbicides with low persistence, and annual respray would likely necessary to control newly emerging plants. In addition, higher rates must be used than with the other two chemicals (one pound versus one-quarter to one-half pound per acre). Picloram could remain effective for 1 or 2 years against knapweed. A small amount of follow-up spraying might be necessary to control skips in the treatment. This would typically involve less than 20 percent of the original treatment area.

Clopyralid is more persistent than 2,4-D and dicamba but less persistent than picloram. Two years of knapweed control could be possible with clopyralid, but it is likely that annual respraying would be required over a larger area than with picloram.

Table 2-2 summarizes the risk of spread of noxious weeds under the various alternatives.

Table 2-2--Relative risk of the spread of noxious weeds.

Alternative 1: No Action	Highest risk of spread of any of the alternatives. Greatest risk that new invading species would find a place establish populations and spread.
Alternative 2: Manual & Cultural	Low risk if carried out at least three times per year on an annual basis. Risk of vegetative spread may be higher than with herbicide control.
Alternative 3: Manual, Cultural & Biological	Low to moderate risk if manual and cultural control is carried out at least three times per year on an annual basis. Moderate risk of vegetative spread if climatic conditions are not suitable for the biological agents.
Alternative 4: Manual, Cultural, Biological & Chemical	Low risk assuming careful follow-up spray and assuming manual and cultural control is carried out at least three times per year in areas close to water. Biological control may reduce the competitiveness of Canada thistle but there is potential for continued spread.

ISSUE 2: IMPACT OF THE CONTROL ALTERNATIVES ON THE ENVIRONMENT

The impact of increasing weed infestation on other resources is elimination of some species from given sites and reduction in species diversity. The No Action alternative would have no other environmental impacts.

Alternative 2, the Manual and Cultural Alternative would have little physical impact on other resources. Ground disturbance would be quite localized.

The two biological agents proposed for the control of Canada thistle have undergone extensive host specificity testing. *Urophora cardui* (gall fly) is very host specific toward Canada thistle. However, two other non-native thistles, *Cirsium vulgare* (Bull thistle) and *Carduus acanthodes* (Plumeless thistle) showed incidental ovipositing during host-specificity tests. *Ceutorhyncus litura* (Stem mining weevil) has a broader host range and can attack several native and non-native members of the *Cirsium* (thistle) genus. No sensitive *Cirsium* species have been identified on the Bonners Ferry Ranger District.

Chapter 4 reviews in detail the possible impacts of herbicide applications on various resources including non-target plant species, soil and water, fish and wildlife species. Generally, the direct impacts would be minimal because of the low toxicity of these compounds and the limited extent of the spraying. The greatest impacts would be to non-target plant species. A few native forbs plants would be eliminated from areas that are directly sprayed. However, these species could readily recolonize from unsprayed areas. Most native forbs and grasses would tolerate the proposed treatments. There are no threatened, endangered, or sensitive plant species on these sites. (Sensitive plant species are those deemed by the Forest Service to be rare, at least locally. See Chapter 4 for further description.)

For some people, herbicide use would represent an undesirable human intrusion in an area that is to be protected from human impacts. For others, however, the human-caused introduction of these aggressive non-native species requires a speedy, effective response to protect native ecosystems and other forest resources.

Table 2-3 summarizes the environmental impacts of the various alternatives.

Table 2-3--Summary of environmental impacts of the alternatives

Alternative 1: No action	Impacts are related to the spread of noxious weeds.
Alternative 2: Manual & Cultural	Minimal impacts. Minor soil disturbance.
Alternative 3: Manual, Cultural & Biological	Low impact expected on native vegetation.
Alternative 4: Manual, Cultural, Biological & Chemical	Visual impacts of site treatment has the potential to disrupt some users experiences. Analysis does not indicate a risk of significant impacts on fish and wildlife. Short term localized impacts on some broadleaf species.

ISSUE 3: IMPACT OF THE CONTROL ALTERNATIVES ON HUMAN HEALTH

The non-chemical alternatives would have little impact on human health and safety. The manual and mechanical alternatives could result in sprains, minor irritations, or injury from flying objects.

Current toxicology data supporting the registration of these herbicides indicate that these compounds provide low risk when used as directed. The issues of carcinogenicity, mutagenicity, and generalized health effects are addressed in Chapter 4. The risks of long-term deferred effects such as cancer are considered very slight and on the order of other risks commonly encountered in everyday life (for example, the cancer risks of transcontinental air flight from increased exposure to cosmic radiation). The exposures to chemicals from these projects would be quite transient and minimal, even on a cumulative basis.

There will always remain some uncertainty regarding the effects of herbicide exposure on human health. Sources of uncertainty include the necessary extrapolation of toxicology data from laboratory animals to humans, the use of high-dose cancer studies to predict rates of cancer from low doses, and the difficulty of predicting human dose levels under the conditions anticipated here. To compensate for this uncertainty, risk was analyzed conservatively which tends to overstate the risk. These factors are reviewed in Chapter 4 and in the Risk Analyses contained in the project file.

COST OF ALTERNATIVES

Table 2-4 displays the estimated on-site cost of implementing each alternative for one year. Monitoring of site conditions and other activities that are provided under all alternatives including the No Action alternative would cost about $2,000 per year.

Following the table is a discussion of the assumptions used to develop these costs. No attempt was made to develop the costs of failure to control noxious weeds or to quantify the beneficial effect of control on biodiversity. These benefits and the cost of impacts on biodiversity are very difficult to quantify on an economic basis.

Table 2-4.--The estimated 1-year on-site costs of the alternatives

Methods	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Manual/Cultural Control	0	$545,343	$371,000	$ 2,400
Biological Control	0	0	$ 21,000	$ 2,200
Chemical Control	0	0	0	$76,400
Total Cost	**0**	**$543,343**	**$517,809**	**$81,000**

The following assumptions were used in determining costs:

1) All costs are for implementing each alternative on all sites **for 1 year**.
Manual control cost estimates assume implementation of the program at least two times during the active growing season.

2) Labor costs for implementation procedures reflect (GS-5) wages totaling $75.00/day and (GS-4) wages at $70.00/day.

3) Stock costs, subsistence and fringe benefits average approximately 85% of the total wage cost to implement the alternative/site.

4) A worker can pull and/or clip and bag approximately one-tenth acre per day depending on the weed infestation level and site conditions. All manual and cultural treatment cost estimates display the total cost of twice a year action.

5) Chemical cost estimates assume the following materials cost: 2,4-D, $11.25/gal.; picloram, $90/gal.; dicamba, $90/gal.; clopyralid, $217/gal.

6) Chemical application costs for the remote sites average approximately $287/acre. This cost per acre figure includes chemical, wages, and travel costs.

7) A worker applying herbicides with a backpack sprayer can cover 3 to 5 acres per day depending on the circumstances.

CHAPTER III

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter:

1. provides a brief overview of the project areas,
2. connects this document to the goals, objectives, and standards outlined in the Idaho Panhandle Forest Plan for the Management Areas in which these sites are located,
3. describes the site characteristics of the areas proposed for treatment,
4. describes the site-specific condition of the resources and attributes that might be affected by the proposed actions.

AREA DESCRIPTIONS

The Selkirk Mountain, Purcell Mountain, and Cabinet Mountain Ecosystems are located in mountainous terrain in northern Idaho. The proposed Environmental Impact Statement covers 410,000 acres that comprise the Bonners Ferry Ranger District of the Idaho Panhandle National Forest. This area is in Boundary County, the northern most county in Idaho. The largest portion of this area is bordered on the west by the crest of the Selkirk range and on the east by the Kootenai National Forest and northwest Montana. The southern boundary is the county line separating Bonner and Boundary Counties. The Northern boundary is the international border separating Canada and the United States. See Appendix
A to review area map.

Portions of two major river drainages (Kootenai River and Moyie River) are located on the Bonners Ferry Ranger District. The valleys of these two river drainages are typical intermountain glaciated valleys which have been subject to extensive stream action since glacial times. The valleys generally range from .5 to 2 miles wide; however, narrow steep canyons also occur on the lower end of the Moyie River valley. Elevations on the valley floor range from 1800 feet near the Canada/U.S.boundary along the Kootenai River to 2633 feet where the Moyie enters the United States from Canada. From the valley floors, the mountains rise abruptly to elevations over 7500 feet.

The climate of the area is primarily affected by maritime weather patterns that are occasionally modified by continental air masses. Weather varies considerably with elevation, slope aspect, and season. Annual precipitation ranges from 25 inches on the valley floor to 80 inches or more in the higher elevations. Snow provides approximately 40 to 80 percent of the total precipitation depending on the location. Snow cover in open areas on the lower to mid valley floors typically vanishes in March or April. Snow accumulation is much greater in the higher elevations and can linger into the summer months.

Soils in the valley floors and lower valley slopes have developed from two types of parent materials: materials deposited by glaciers (glacial tills) and post-glacial alluvial deposits. Glacial materials are often deposited as unstratified clayey and loamy deposits. Water-deposited materials occur on the stream terraces and alluvial fans of the valley bottoms. Soils on the higher terraces have developed in stratified sand, gravel, and cobble. Soils on the lower terraces have developed in stratified silts, sands and gravels which are frequently deposited and disturbed.

Soil development has also been affected by wind-deposited, volcanic ash. Soils in relatively undisturbed areas on the valley floor often contain soil profiles several inches in depth that have been significantly affected by volcanic deposits that originated in Cascade Range eruptions such as Mount Mazama.

The vegetation is a complex mosaic of different aged stands of *Pinus contorta* (lodgepole pine), *Pseudotsuga menziesii* (Douglas-fir), *Pinus ponderosa* (Ponderosa pine), *Larix occidentalis* (Larch), *Picea* (Spruce), *Abies lasiocarpa* (subalpine fir), Tsuga heterophylla (western hemlock), and Thuja plicata (western redcedar).

Douglas-fir is believed to be the climax tree species on most dry sites. Common shrubs include *Arctostphylos uva-ursi* (kinnikinnik), *Berberis repens* (Creeping Oregon grape), *Symphoricarpos albus* (Snowberry), *Holodiscus discolor* (ocean spray), and *Physocarpus malvacea*, ninebark. More mesic (moister) sites support an understory of *Linnaea borealis* (twinflower), Oregon grape, kinnikinnick, *Cornus stolonifera* (Red-osier dogwood), *Shepherdia canadensis* (Buffalo-berry), *Agrostis stolonifera* (Redtop), and *Aster occidentalis* (Western aster). On moister sites larch is fairly extensive on the lower to mid slopes.

Lodgepole pine is the most abundant conifer found throughout the area in all but the higher elevations. It occurs in all densities and age class distributions, and is frequently in pure, even-aged stands.

Ponderosa pine is found to a limited extent on some of the dry sites at low elevations. This species often occurs in the open, park-like stands. Understories in these stands are dominated by bluebunch wheatgrass, rough fescue, and other bunchgrass species. Scattered Douglas-fir and lodgepole pine are also found on these sites and account for most of the coniferous reproduction.

Spruce grows over a wide range of elevations on sites with abundant soil moisture. Spruce is found primarily in riparian areas and with subalpine fir on mesic northerly slopes.

River bottom lands are well vegetated with conifers, primarily lodgepole pine, Douglas-fir, larch, ponderosa pine, and Engelmann spruce. Associated hardwood tree species include birch, cottonwood, and aspen with willow, alder, and other shrubs.

FOREST PLAN MANAGEMENT DIRECTION FOR THESE SITES

As explained in Chapter 1920 of the Forest Service Manual, planning for units of the National Forest System involves two levels of decisions. The first is the development of a Forest Plan that provides direction for all resource management programs, practices, uses, and protection measures. The second level of planning involves the analysis and implementation of management practices designed to achieve the goals and objectives of the Forest Plan. The second level requires site-specific analysis to meet National Environmental Protection Act (NEPA) requirements for decision making.

This EIS presents the results of the site-specific analysis required for the second level of decision. Thus it is appropriate to review the Forest Plan direction for the Forest in general, and for the specific Management Areas in which these sites are located, in order to show the connection between the decisions made in the Forest Plan and the decisions proposed in this EIS.

A Forest objective for the first planning period is to inventory, map, and complete an activity schedule for significant weed plant communities, which include *Centarea maculosa* (Spotted knapweed), *Hypericum perforatum* (St. Johnswort or Goatweed), *Cirsium arvense* (Canada thistle), *Linaria dalmatica* (Dalmation toadflax), *Tanacetum vulgare* (Common tansy), *Hieracium aurantiacum* orange hawkweed, *Hieracium pratense*, meadow hawkweed, *Euphorbia esula*, leafy spurge, *Cynoglossum officinale* hound's-tongue, *Chondrilla juncea*, rush skeleton weed, and *Lythrum salicaria* purple loosestrife. The Bonners Ferry Ranger District has completed inventories for the Selkirk and Cabinet Ecosytems and most of the Purcell Mountain Ecosystem.

The Idaho Panhandle Forest Plan requires the development of management direction for noxious weeds. The goals and standards for the protection of other resources such as soil and water also have implications for weed-control projects. These standards will be reviewed below in our discussion of the resources potentially affected by these control activities.

Project sites occur in a variety of land management allocations. Land management allocations affected include Management Areas (MA's) 1, 2, 3, 4, 7, 9, 10, and 17. A brief statement of the golas for each of these management areas is as follows:

MA 1 - Provide for long-term growth and production of commercially valuale wood products on those lands that are suitable for timber production.

MA 2 - Manage identified grizzly bear habitat to support the Forest's share of a recovered grizzly bear population while providing the production of commercially valuable wood products.

MA 3 - Provide sufficient winter forage areas to support existing and projected big game opulatio while providing for the production of commercially valuable wood products.

MA 4 - Provide winter forage to support existing and projected big game populations through scheduled timber harvest and permanent forage areas.

MA 7 - Manage identified caribou habitat to support the Forest's share of a recovered caribou population, while providing for the prodction of commercially valuable wood products.

MA 9 - Manage to maintain and protect existing improvements and resource productive potential within minimum investments.

MA 10 - Provide the opportunity for a semi-primitive recreation experience. The area will be managed in its present condition, with no new roads.

MA 17 - Manage for developed recreation opportunities in a roaded natural and rural recreation setting.

The standards for all these allocations include the use of integrated pest management for protection against pests.

AFFECTED RESOURCES ON PROPOSED TREATMENT SITES

AIR QUALITY

All projects of the Idaho Panhandle National Forests (IPNF) must comply with procedural requirements of the Clean Air Act (US EPA, 1971) and State Implementation and Smoke Management Plans. The United States Environmental Protection Agency (EPA) has adopted national primary and secondary ambient air quality standards (NAAQS) under the authority of Section 109 of the Clean Air Act. These standards include acceptable levels of pollutants and particulate matter. The Prevention of Significant Deterioration (PSD) requirements of this Act limit the increase of pollutants such as these from point sources that could impact Class 1 areas. The Cabinet Wilderness, approximately 20 miles to the southeast of the Bonners Ferry Ranger District, is the closest Class 1 airshed.

The air quality in the IPNF is generally good to excellent throughout a majority of the year. Seasonal variation in weather patterns and human activities contribute to variation in the air quality. Smoke from agricultural field burning, wood burning stoves, prescribed burning and wildfires contribute to seasonal deterioration of the air quality. Dust from agricultural lands and motor vehicle traffic on gravel and dirt roads can cause reduced air quality and visibility, especially when there are high winds.

The project area lies within the state of Idaho's North Idaho smoke management zone. The IPNF is part of the Northern Region of the Forest Service. This region has signed a Memorandum of Agreement with the State of Montana, and is a member of the Montana State Airshed Group. This group monitors air quality in the state of Montana, their concern is primarily smoke and particulates from forest residue burning. Prevailing winds in the project area are southwest. Activities in this portion of Idaho predominately affect air quality in Montana airsheds.

FISHERIES

Species Present

Bull Trout (Salvelinus confluentus)

The bull trout is considered a Category C1 species under the Endangered Species Act (1973). The U.S. Fish and Wildlife Service decided on June 8, 1994 that the bull char is warranted but precluded from listing. On February 6, 1995 the USFWS changed the bull char status to warranted. This means significant threats exist to the continued existence of the species and the USFWS is in the process of drafting regulations. The Forest Service recognizes bull trout as a sensitive species in Region 1.

Bull trout are found in cold water streams, rivers, and lakes (U.S.D.A. 1989). Bull trout spawn in late summer through fall (August to November), often in areas of ground water infiltration. Fry hatch at the end of January and emerge in early spring (April). Juveniles remain near the stream bottom or in low velocity habitat (pools and pocketwater) for the first two years of their life. Unembedded substrate and dispersed woody debris are commonly used forms of cover. Most juveniles migrate at the beginning of the third growing season into larger lakes or rivers. Bull char usually mature at age 5 to 6. Adult migration begins in early spring (March or April) and may extend through the entire summer. Most fish are in spawning streams by August. Some adults will spawn more than once during their lifetime, but they may not spawn each year (Pratt 1992).

Bull trout are present in several of the drainages proposed for spraying. Fluvial bull trout from the Kootenai River have been found at the mouth of Snow and Caribou Creeks (Paragamian 1994). Bull trout have also been located in Myrtle, Trout, Boundary, Grass, Parker, and Long Canyon Creeks. It is not known whether these fish are from resident or fluvial populations. The status of bull trout in the Kootenai River, below the Kootenai falls, is thought to be at a high risk of extinction (personal communication, Dave Cross, IPNF Fisheries Biologist, 1995)

Westslope Cutthroat Trout (Oncorynchus clarki lewisi)

Westslope cutthroat trout are listed as a Category species, as of November 15, 1994, under the Endangered Species Act, (1973). This means that the U.S. Fish and Wildlife Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on the biological vulnerability and threats are not currently available to support the proposed rules. Westslope cutthroat are also recognized by the Forest Service as a sensitive species in Region 1.

Westslope cutthroat trout occur in clear, cool streams usually with water temperatures less than 17 degrees celsius. Cutthroat habitat contains rocky, silt-free riffles, for spawning and slow, deep pools with well vegetated stream banks for feeding and resting (U.S.D.A. 1989). They tend to occupy headwater areas especially when other salmonid species are present in the same stream (Hickman and Raleigh 1982). Cutthroat trout usually reach sexual maturity at age 3 to 4. They spawn in the spring, usually in April or May. Fry and juveniles occur in stream sections that are shallow with slow velocity flows. As fish grow larger and mature, they seek out deep water habitat types such as pools and deep runs (Hickman and Raleigh 1982; Baltz et al. 1991). During winter, cutthroat trout typically seek deeper water associated with large woody debris (Moore and Gregory 1988). Strong populations of this species exist in only 36% of its original range in Idaho (Rieman and Apperman, 1989).

Westslope cutthroat trout are present in most drainages of the Kootenai and Moyie River. Westslope cutthroat have not been found in McGinty, Gable, Twentymile, Cow, or Katka Creeks, drainages where spraying is proposed. The status of populations in remaining watersheds proposed for spraying is unknown. In drainages where introduced rainbow and brook trout occur, long term viability of westslope cutthroat may be in question (personal communications Dave Cross, IPNF Fisheries Biologist, 1995). In many cases this may not be due to solely introduced species. Instead, cumulative effects from fishing pressure, introduced species, and a

depressed cutthroat population from managed disturbances have all played a part to tip the balance against cutthroat.

Redband Trout (Oncorhynchus mykiss gibbsi)

Redband trout are listed as a C2 species under the Endangered Species Act (1973) and are recognized as a sensitive species in Region 1.

Redband Trout are a strain of rainbow trout that are native to the Kootenai River Basin. The mainstem Kootenai retains a hybrid mixture of redband/rainbow/cutthroat, but barriered tributaries may have headwater redband populations (U.S.D.A. 1994). Field evidence indicates that interior redband and westslope cutthroat generally coexisted below Kootenai Falls before exotic species were introduced. For the most part the two species were segregated spatially, but in sympatric situations they were able to maintain a high degree of genetic integrity. It is only where the coastal rainbows were introduced that we see hybrid swarms of rainbow-redband-cutthroat where few if any individuals are genetically pure.

The stocking of coastal rainbows (as early as 1914) has complicated the redband picture, as did the release of eastern brook trout, yellowstone cutthroat, and a host of other species (U.S.D.A. 1994). Redbands are generally found to be virtually extirpated through hybridization with introduced rainbows. In essence, in those places where someone has bothered to look for redbands, it looks like there are very few clues left to interpret about their status.

Preliminary results from genetic surveys conducted in 1994, located redband trout in only three of the nine streams surveyed. Saddle and Grass Creeks were found to contain genetically pure populations, while Boundary Creek has a 97% pure population (personal communication, Doug Perkinson, Kootenai National Forest Fisheries Biologist, 1995).

White Sturgeon (Acipenser transmontanus)

The United States Fish and Wildlife Service has listed the Kootenai River population of White Sturgeon as endangered under the Endangered Species Act (Federal Register 59:171:45989-46001).

White sturgeon are anadromous in most of the larger rivers in which they occur but are landlock in the middle and upper Columbia River system. The Kootenai River population range includes lake and river habitats between the outflow of Kootenay Lake and Kootenai Falls upstream in Montana. Most fish have been found only in the Kootenai River, but a few have been located in larger tributary streams (Graham 1981). In 1989, a State of Montana enforcement officer cited an angler for taking of a sturgeon in the Yaak River (U.S.D.A. 1993). However, few have been sighted in other tributary streams .

Spawning period for white sturgeon occurs in May and June. Spawning probably occurs over rock or bedrock substrate in swift currents near rapids, when water temperatures are between 8.9 and 16.7 degrees celsius (Graham 1981). It is believed that that most spawning in the Kootenai River occurs in the canyon section between Bonners Ferry and Kootenai Falls. Sturgeons have not been identified in any of the tributary streams proposed for spraying.

Other Species

In addition to the above mentioned species, tributaries and lakes of the Moyie and Kootenai River support sculpins (Cottus), slimy sculpins (Cottus cognatus), redside shiner (Richardsonius balteatus), mountain whitefish (Prosopium williamsoni), kokanee salmon (Oncorhynchus nerka), rainbow trout (Oncorhynchus mykiss), peamouth (Mylocheilus caurinus), northern squawfish (Ptychocheilus oregonensis), pumpkinseed (Lepomis gibbosus), largemouth bass (Micropterus salmoides), yellow perch (Perca flavescens), crappie (Pomoxis), and brook trout (Salvelinus fontinalis).

HUMAN RESOURCES and HUMAN HEALTH

The impacts of the control alternatives are analyzed for two groups of people, the workers involved in the control activity and the general public who might be on or near these sites. Chapter 4 discusses risk to human health.

RANGE

Grazing areas are identified as transitory rangeland within the Cow Creek, Grass Creek and lower Trout Creek drainages. Transitional rangelands are those lands whose open character is maintained by fire, flooding, pest outbreaks, or other disturbances. These sites could eventually revert to forest cover if natural disturbances are controlled. Both wild ungulates and domestic livestock frequently forage throughout these isolated areas.

RECREATION

The sites under consideration are located primarily along Forest roads and trails where dispersed recreation such as driving for pleasure, hiking, hunting, or traveling to an outdoor forest activity would occur.

A few sites are associated with campgrounds including Robinson Lake, Copper Creek, Brush Lake, Smith Lake, and Meadow Creek Campgrounds. These sites vary in the amount of developed recreational use from low to high. These sites were identified for treatment due to current limited noxious weed populations which if controlled may prevent invasion into riparian zones.

SOILS AND VEGETATION TYPES

Soils are an important part of the analysis primarily because of the interaction of soil characteristics and herbicides. Three soil characteristics of particular importance are the percent organic matter of the soil, the available water holdilng capacity of the soil, and the permeability of the soil. These three characteristics plus the chemical properties of the herbicide determine the availability of the herbicide for uptake by plants and its tendency to move through the soil.

When incorporated into the soil, part of the herbicide dissolves in the soil water and part adsorbs onto soil particles, primarily organic matter and fine particles. The amount of herbicide adsorbed onto soil particles depends on the characteristics of the chemical and on the amount of organic matter and fine material in the soil. Any herbicide that remains in soil water is available for uptake by plant roots. However, if the water moves off-site or out of the rooting zone it takes some of the dissolved herbicide with it.

As proposed in this EIS, the majority of the herbicide will be applied to the road prism. Soils within the road prism are generally devoid of organic matter, have low water holding capacity and generally restricted permeability rates. Herbicides applied to roads have a high risk of being carried off-site either dissolved in water or adsorbed onto soil particles. If these transported herbicides end up being directed off the road and onto the undisturbed forest floor, then, a very good soil situation exists for retaining the herbicide in the surface soils. If the transported herbicide is directed into ditches and streams, little to no filtration will take place.

Most undisturbed soils in North Idaho have a surface litter layer which ranges from 2 to 5 inches thick. The lower part of this litter layer is highly decomposed and would have a high capability of adsorbing herbicide. Below the the organic litter layer is volcanic ash which occurs as the surface layer of mineral soil. This ash layer ranges from 7 to 16 inches in thickness. The top part of the ash is enriched in organic matter and the entire ash layer has a very high water holding capacity and herbicide-nutrient holding capacity.

The risk of herbicide moving through undisturbed forest soils into the ground water is low in most places. An exception is in the lower Purcell trench, where areas of wind blown glacial sands have formed sand dunes with little or no volcanic ash deposition on top of them. On these sites the soils are not conducive to retaining herbicides within the surface soils. Little organic matter occurs, the water holding capacity is very low and the permeability is very rapid. These soil characteristics will provide easier movement of herbicides through the soil, but ground water is probably quite deep in these areas.

There are two basic categories of vegetation types associated with the projects areas: Riparian areas and upland areas. There are only a couple of sites occupying riparian areas. These sites occur along the lower reach of Trout Creek and one of the lower reaches of Grass Creek. The floodplains associated with these riparian sites are nearly level to gently sloping. High water tables are common near stream channels. As one

moves away from the stream channels the chance of encountering a high water table diminishes.

Upland areas are where most of the sites are located. Upland areas do not have the hydrologic regimes and resulting moisture to support the vegetation associated with riparian areas.

While most of the proposed treatment sites are located in upland areas, the locations of these sites are commonly along roads or trails often leading to riparian areas. The Selkirk and Cabinet Mountain ecosystems contain several species of sensitive plants. Sensitive plant species are those species whose population viability is determined to be a concern due to evidence of a significant current or predicted downward trend in population or habitat. The vast majority of these species habituate riparian zones. A list of species present on the Bonners Ferry District as well as the ecosystems they are found
in and drainage population size is part of the project file.

Vegetation surveys have been done for all sites. On these sites, there are no threatened or endangered plant species as listed under the Endangered Species Act. In addition, there are no sensitive plant species on these sites.

Within the Selkirk Mountain ecosystem, there are fens*, a type of wetland habitat. These are bog-like low-gradient areas where peat soils are formed. These sites are often dominated by sedges and sphagnum mosses. There are 5 sensitive plant species that grow primarily in these fens. Two of the noxious weeds species, meadow and yellow hawkweed, would find this habitat suitable for colonization.

* *Fen* A non-acidic peat forming wetland that receives nutrients from sources other than precipitation, usually through ground water movement. Most fens have standing water dominated by emergent vegetation, open peatland with sedges and short shrubs, or raised peat dominated by shrubs and trees.

WILDLIFE

Several threatened and endangered animal species may occur or have suitable habitat in the project areas. These are the grizzly bear (threatened), the woodland caribou, the northern Rocky Mountain wolf (gray wolf), and the bald eagle (all three listed as endangered). Further information on these species can be found in the Biological Evaluation.

Treatment areas include the recovery zones for the Selkirk Mountain and Cabinet/Yaak Grizzly Bear Ecosystems. The woodland caribou recovery zone is also included in some treatment areas in higher elevations of the Selkirk Mountains. Although the recovery zone for gray wolves is further south in central Idaho, the Idaho Panhandle is a transition area and is used by wolves travelling from Canada to the south. The entire district is within the generalized recovery zone for bald eagles, but habitat only occurs within treatment areas in the Robinson Lake vicinity and the vicinity of the Kootenai River along the Katka Road.

The U.S. Fish and Wildlife Service has developed recovery plans for all four species. Copies of these recovery plans are available at the Idaho Panhandle National Forest's Supervisor's Office.

There are numerous species of wildlife designated as sensitive by the Region 1 Regional Forester. Those known to be present, or whose habitat occurs near treatment areas, are the eleven species listed for the Bonners Ferry Ranger District. These are: Coeur d'Alene salamander, common loon, harlequin duck, boreal owl, flammulated owl, black-backed woodpecker, lynx, fisher, wolverine, Townsend's big-eared bat, northern bog lemming. Of these, two species are not known to occur on the district, and have marginal habitat. These are common loon and Townsend's big-eared bat.

Further information on these species is presented in the Biological Evaluation.

The Bonners Ferry Ranger District has four species which are used as management indicator species. These are pileated woodpecker, goshawk, pine marten and white-tailed deer. These species vary in abundance from uncommon

(goshawk) to abundant (white-tailed deer). Pileated woodpecker, goshawk and pine marten prefer older timbered stands, and white-tailed deer prefer a mixture of timbered stands with some openings.

Other faunal groups of concern include a diverse group commonly referred to as neotropical migrant birds. These birds typically are small songbirds that migrate from northern breeding grounds to the neotropics for the winter, but as a management group also include resident birds such as chickadees. Many of these birds are insectivorous, but some are granivorous. Their habitat requirements vary from virtually rocky slopes (rock wrens), to meadows and lower seral stages (chipping sparrows), to densely timbered old growth stands (winter wren). Around 150 species occur within the great elevational distances of the treatment areas.

WATER QUALITY

Both the Kootenai and Moyie Rivers flow through the Bonners Ferry Ranger District. The headwaters for both rivers are in Canada, the Kootenai River also flows through the State of Montana. Beyond the confluence of the Moyie and Kootenai Rivers, The Kootenai flows west and north back into Canada. The Idaho Department of Health and Welfare Rules and Regulations, Title 1, chapter 2, "Water Quality Standards and Waste Water Treatment Requirements" identify the beneficial uses for these rivers. The beneficial uses include: Domestic water supply, Agricultural water supply, Cold water biota, Salmonid spawning, Primary and Secondary contact recreation. Both rivers have been identified as a Special Resource Waters.

There are several municipal watersheds within the District. Myrtle Creek is the municipal watershed for the community of Bonners Ferry. Twentymile and Brown Creeks are the water sources for the Naples Area. Mission Creek is the watershed for the Mount Hall Area. Caribou Creek is the watershed for the Deep Creek Area.

Myrtle Creek and the Moyie River are both stream segments of concern. Site specific BMP's have been developed but do not deal with herbicide application. The primary concern for Myrtle Creek is oil contamination from spills. There are no Outstanding Resource Waters on the Bonners Ferry Ranger District.

The Water Quality Antidegradation Policy (IDAPA 16.01.2051) states that the existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. The Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code, Rule 6 lists Best Management Practices applicable to the use of chemicals. BMP's applied to these proposed projects are discussed in Chapter 4 and the section on Mitigation Measures.

IDAPA 16.01.2250 adopts the National Toxic Rule water quality standards for acceptable levels of toxic substances.

Wetlands, Floodplains, and Riparian Areas.

There are no proposed activities within wetlands. As mentioned in a preceeding section "Soils and Vegetation", proposed activities are designed to keep the noxious weed species from invading wetlands in the Selkirk and Cabinet Mountain ecosystems and some of the wetlands in the Purcell Mountain ecosystem. Activities are proposed in two floodplain/riparian areas.

GRASS CREEK

Approximately 0.25 acre of meadow hawkweed has been identified in a riparian area in Grass Creek. The site is between the creek and road #636, approximately 1/4 mile from Boundary Creek. The riparian vegetation consists of cedar, spruce and hemlock trees with understory shrubs. The population of hawkweed is spotty and could be effectively treated with 2,4-D.

The majority of Grass Creek is characterized as having a low gradient, fairly straight channel pattern. It flows through a narrow, gently sloping, U-shaped glacial valley. The Use Designation for Grass Creek is Primary Contact Recreation (IDAPA, 1992). The Forest Service also recognizes Cold Water Biota and Salmonid Spawning as uses for Grass Creek. Grass Creek is a Class I Stream per

definitions of the Idaho Forest Practices Act. Grass Creek has been identified as an important fisheries stream in the Forest Plan (IPNF, 1987). The majority of the length of Grass Creek is MA 16.

TROUT CREEK

Meadow hawkweed populations are located adjacent to Trout Creek along road #417. In this area, the creek has been channelized and rip rap has been placed against the south bank. The channel bottom consists of cobble and smaller boulders. An island of deposited cobble sized material is located in the middle of the creek. Vegetation on the island consists of alder and cedar. Meadow hawkweed has also infesting the island. The conifer vegetation on the island is approximately 10 years of age, indicating that the island has been stable for several years. Riparian vegetation is mostly absent from the banks of the stream. Vegetation consists of grass (quack grass with some timothy) and occasional clumps of alder. There is a grove of dense cedar trees between the road and grassy area, no hawkweed was observed within the densely timbered area.

CHAPTER IV

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter evaluates the potential environmental consequences of each of the alternatives on each site. This evaluation considers the following:

- direct effects
- indirect effects
- cumulative effects
- probable environmental effects that cannot be avoided
- possible conflicts with the plans and policies of other jurisdictions
- the relationship between short-term use and long-term productivity
- the irreversible and irretrievable commitment of resources

Potential environmental consequences are evaluated for each of the affected resources described in Chapter 3. Definitions of the different types of effects are listed below.

1. Direct effects are caused by the action and occur at the same time or place.

2. Indirect effects are caused by the action and are later in time or farther removed in distance but still reasonably foreseeable.

3. Cumulative effects are the impacts which result from the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency or person undertakes such actions. For example, the potential for cumulative impacts on water quality from several herbicide projects in a given watershed is addressed in the section entitled Fisheries and Surface Water Quality.

ORGANIZATION OF THIS CHAPTER

The discussion of the environmental impacts of the various alternatives is intended to be site-specific without being tediously repetitive. For each resource presented in Chapter 3, environmental impacts are discussed for the various site alternatives.

ENVIRONMENTAL IMPACTS ON AFFECTED RESOURCES

AIR QUALITY

The no-action alternative and the non-chemical control alternatives would have no impacts on air quality if implemented on any of the sites.

Alternatives that involve spraying of herbicides would have a short-term, localized impact on air quality because of the drift of spray particles. Generally the greatest part of this drift would settle out within 25 feet of the site, although small amounts could carry greater distances (USDA Forest Service, 1993). The smell of chemicals such as 2,4-D may also persist at a spray site for several days following spraying.

FISHERIES and SURFACE WATER QUALITY

The discussion of impacts of the alternatives on surface water quality has been combined with the section on fisheries because of the relationship between topics. The discussion of groundwater quality is provided in the section on soils.

INDICATORS

The following analysis will focus on the effects to water quality, the toxic characteristic of each herbicide, and the concentration of herbicide to which aquatic biota are exposed.

EFFECTS SPECIFIC TO ALTERNATIVES

Alternative 1: No Action

Direct, Indirect, and Cumulative Effects

As discussed in greater detail in the section on Vegetative Community Diversity, without treatment it becomes increasingly likely that noxious weeds will become more widely established across the Bonners Ferry Ranger District. An indirect effect of noxious weed invasion could be increased water runoff and sediment yield from infested sites. Lacey et al. (1989) have shown an almost three-fold increase in sediment yield from knapweed sites compared to a non-infested bunch grass site. Runoff increased by about 50 percent from the knapweed site.

At the present time, most infested sites are along road clearings. Noxious weeds are probably having little effect on sediment yield in comparison to other road related activities (road use, maintenance, etc.). Impacts from future spread of the weeds would depend on the slope, soil characteristics, precipitation patterns, and distance to water from the infested sites. However, even under the worst-case noxious weed infestation scenario, it is unlikely that increase in sediment yield to streams would be sufficient to affect fisheries or water quality.

Alternative 2: Manual and Cultural Control

Direct, Indirect, and Cumulative Effects

Manual treatment would result in localized soil disturbance. An increase in sediment to streams from the manual treatment along road cuts and fills and within the two riparian areas is possible, but the increase would likely be undetectable for several reasons. First, disturbed areas would be replanted with grass seed after treatment reducing erosion as roots became established . Second, not all sediment reaching ditchlines would be transported directly to streams. Many ditchlines are intercepted by relief culverts, which drain onto the forest floor. Finally, soil disturbance would be minimal and localized in comparison to the entire watershed.

Cultural treatments (seeding, transplanting, and fertilizing) would not effect fisheries. Fertilizers would be applied according to Forest Service and manufacture guidelines. Runoff nutrient concentrations therefore would not be large enough to enrich streams. Seeding and transplanting would involve limited soil disturbance. There are no cumulative effects with this alternative.

Alternative 3: Manual, Cultural, and Biological Control

Direct, Indirect, and Cumulative Effects

Effects from manual and cultural treatments are similar to those displayed in alternative 2. Release of biocontrol agents would have no direct effect on fisheries or surface water quality. The biocontrol agents would not compete with aquatic insect species since their food base is very specific, nor would they provide more than an incidental food source for fish. There are no cumulative effects with this alternative.

Alternative 4: Manual, Cultural, Biological, and Chemical Control

Direct, Indirect, and Cumulative Effects

Effects from manual, cultural, and biological treatments are similar to those displayed in alternatives 2 and 3.

The herbicides proposed for use on these site are all characterized by relatively low aquatic toxicity. The 96-hour LC_{50} for the four herbicides is provided in Table 4-1. The 96-hour LC_{50} refers to the concentration that is lethal to 50 percent of the fish exposed at that level for 96 hours. The lower the LC_{50} the more toxic the compound.

Table 4-1.Toxic levels of herbicides to fish

Herbicide (test species)	96 hour LC50 (milligram/liter)	LC50 divided by 10	NOEL (milligram/liter)
Clopyralid (rainbow trout)	103	10.3	not available
2,4-D acid (cutthroat trout)	24	2.4	not available
2,4-D amine (rainbow trout)	420	42	not available
Dicamba (rainbow trout	28	2.8	not available
Picloram	3.5	0.35	0.29

Notes: 2,4-D, dicamba, and picloram values are taken from Mayer and Ellersieck 1986 and Woodward 1976 and 1979. Clopyralid value is from Dow Chemical Company 1986.
2,4-D acid is the parent compound which is formulated in a variety of forms, including the amine which would be used under the 2,4-D alternative.

Although the LC_{50} is frequently used as a toxicity standard, fifty percent fish mortality is generally not acceptable. Because we often do not have long-term test results that provide safe concentrations or no-observed-effect levels (NOEL), the U.S. EPA has recommended that the 96-hour LC_{50} be divided by 10 to set a standard for concentrations to protect aquatic species (U.S. EPA 1986). Table 4-1 provides these concentrations, which are used as a benchmark to judge the significance of possible impacts. It is interesting to note that the NOEL for picloram developed from long-term laboratory studies corresponds fairly closely to the LC_{50} divided by 10 (see Table 4-1).

The second part of the risk analysis for aquatic species involves determining the possible herbicide concentration in streams. Field studies of pesticide spray operations have shown that pesticide input to streams ranged from non-detectible to 6 percent of the amount applied (as reviewed in Monnig 1988).

In order to predict the potential water quality impacts of herbicide applications on the sites under consideration, it is important to distinguish between infiltration-dominated sites and runoff-dominated sites. In all but the most severe conditions, rainfall percolates into the soil on an infiltration-dominated site. On a runoff-dominated site, rainfall is more likely to produce overland flow. These two classes of sites are differentiated on the basis of vegetative cover, soil type, degree of disturbance and compaction, and slope. The majority of the proposed treatment sites are runoff-dominated (road cuts and fills), except for Saddle Creek, where the majority of the proposed treatment sites are previously harvested stands adjacent to roads. Roads enhance runoff by concentrating flows on compacted road surfaces and ditches, intersecting groundwater flow from cut slopes, and using coarse material with low organic matter to create the fill slope. Since the Saddle Creek sites are undisturbed forest soils, they were determined to be infiltration-dominated.

Based on a review of scientific studies of picloram runoff to streams (Rice 1990), it is estimated that a maximum of 10 percent of the herbicide applied on a runoff-dominated site and 1 percent on an infiltration dominated site could be lost to the stream in a six hour period. Because of its relatively long environmental persistence and relatively low soil adsorption (high mobility), picloram represents the worst case of the herbicides analyzed here.

On this basis, the worst-case concentrations of herbicide can be calculated for drainages in the vicinity

of the proposed treatment sites. Each seasons entire herbicide application was calculated per drainage as if weeds were sprayed continuously along each road in a matter of a few days instead of over a period of 1 to 2 months. It was assumed that a severe thunderstorm could wash 10 percent of the active ingredient into the stream on runoff-dominated sites and 1 percent on infiltration dominated sites over a six hour period. The average cubic feet per second (cfs) water yield for the month of July was used to calculate the liters of water produced during an average 6 hour time period. Herbicide application is conducted mid-May through early August, stream flow for the month of July was used as a worse case since the July flow is much lower than the June flow. Five year average water yield was used to calculate the yields for Boulder, Smith and Boundary Creeks, this information was obtained from stream guages. The yield per acre of drainage from these drainages was used to calculate an estimated cfs water flow for the remaining drainages. See Table 4-3 for results..

With this methodology, Meadow Creek showed the highest concentration of Picloram at 0.0287 mg/L (Table 4-3). Grass Creek showed the highest concentration of 2,4-D at 0.0690 milligrams per liter (a mg/L is equivalent to a part per million). These results are well below the estimated NOEL. With the average july CFS water yield of these drainages, this analysis shows that 100 percent of the application amount scheduled for each drainage could be washed into the creek over a period of 6 hours and the concentration would still be less than NOEL.

Again it should be emphasized that these calculations represent a worst case scenario and the probability that these concentrations would be reached is very low. It is unlikely that any herbicide would be detected in stream water as a result of these spray operations because of the low level of herbicide use spread over a period of 2 months or more compared to the water yield in these drainages over the same period of time.

A report by Scott et al. (1976), of the Fish and Wildlife Service, concluded that a concentration of 0.6 ppm picloram decreased cutthroat fry growth by 25%. No adverse effects were observed when concentrations were below 0.3 ppm. Woodward (1979) concluded that picloram increased the mortality of fry in concentration above 1.3 ppm and reduced their growth in concentrations above 0.61 ppm when exposure exceeded 20 days. Worst case scenario concentrations calculated in Table 4-3 are well below these documented effect levels or the 0.35 mg/L concentration listed in Table 4-1.

Concentrations for clopyralid, dicamba, and 2,4-D that could enter streams under a worst case scenario are also low, see Table 4-3. The highest concentration of clopyralid, dicamba, and 2,4-D is .0209 mg/L, .0155 mg/L, and .3478 mg/L respectively. These are far below the LC_{50} divided by 10 value reported in Table 4-1.

When herbicides are applied, there is often concern that they will bioconcentrate in organisms through uptake and retention by tissue or gills. For this to occur, retention of a pollutant must exhibit a high resistance to breakdown or excretion by an organism to allow a sufficient uptake period for an elevated concentration. A high concentration must also be applied for an extended period of time. Bidlack (1980) studied channel catfish exposed up to 28 days to picloram at 1 ppm (mg/L). Analysis showed that picloram did not bioconcentrate. Each herbicide proposed has worst case scenario concentrations below 1 mg/L and would not be applied over an extended period. Therefore, there is a low risk of bioconcentrating.

Concern is sometimes expressed over the possible cumulative or synergistic effects of mixtures of chemicals on sensitive resources. Synergism is a special type of interaction where combined effect of a certain herbicide with other chemicals in the environment is greater than the effect of any one chemical alone. This issue is discussed in greater detail in the section on Human Health Impacts. As noted there, EPA currently supports an additive model in predicting such interactions. Even with the assumption that the chemicals are present simultaneously, their additive concentrations are still well below the NOEL thresholds. Furthermore, where more than one herbicide is applied, the dosage would be reduced (personal communication, Bob Klarich). From the small doses expected from this project, synergistic effects are not expected.

Herbicides can also indirectly influence fish populations by affecting the populations of other organisms upon which fish are dependent. Table 4-2 provides toxicity data for other aquatic organisms (eg. macro-invertebrates).

As indicated in Table 4-2, these herbicides are generally less toxic to lower orders of aquatic organisms than to fish species. Although the species listed in Table 4-2 are not the only aquatic organisms found in these waters, they are used by the U.S. Fish and Wildlife Service and the U.S. EPA as indicators of a wide range of aquatic organisms. Again, the worst-case concentrations of the herbicides in water are well below levels that would affect these organisms.

Table 4-2.Toxic levels of herbicides to aquatic organisms other than fish

Herbicide	Test Species	Test Results
Clopyralid	Daphnids (*Daphnia* sp.)	48 hr LC50 is 225 mg/L
Clopyralid	Ram's horn snail (*Helisoma trivolvis*)	No mortality after 48 hours in a solution containing 1 mg/L
Clopyralid	Green Algae (*Selenastrum capricornutum*)	96 hr LC50 is 61 mg/L
Clopyralid	Duck weed (*Lemna minor*)	No growth reduction at 2 mg/L after 21 days
2,4-D amine	*Daphnia magna*	48 hr LC50 is greater than 100 mg/L
2,4-D amine	Seed shrimp (*Cypridopsis vidua*)	48 hr LC50 is 8 mg/L
2,4-D amine	Scuds (*Gammarus fasciatus*)	96 hr LC50 is greater than 100 mg/L
2,4-D amine	Midges (*Chironomus plumosus*)	48 hr LC50 is greater than 100 mg/L
Dicamba	*Daphnia magna*	96 hr LC50 is greater than 100 mg/L
Dicamba	Sow bugs (*Asellus brevicaudus*)	96 hr LC50 is greater than 100 mg/L
Dicamba	Scuds (*Gammarus fasciatus*)	96 hr LC50 is greater than 100 mg/L
Dicamba	Shrimp (*Palaemonetes kadiasis*)	96 hr LC50 is 28 mg/L
Picloram	*Daphnia magna*	48 hr LC50 is 76 mg/L
Picloram	Scuds (*Gammarus fasciatus*)	96 hr LC50 is 27 mg/L
Picloram	Scuds (*Gammarus pseudolimnaeus*)	96 hr LC50 is 16.5 mg/L
Picloram	Stonefly (*Pteronarcys californica*)	96 hr LC50 is 4.8 mg/L
Values provided on this table are taken from Mayer and Ellersieck 1986 (2,4-D, dicamba, and picloram) and Dow Chemical Company 1986 and undated (clopyralid).		

It must be recognized that Forest Service spraying is minimal compared to the overall use of herbicides. A demonstration that Forest Service spraying on a specific site is not affecting a specific aquatic resource does not exonerate all possible applications of these herbicides. The U.S. EPA has the overall responsibility for determining the possible

aquatic and other environmental impacts of these herbicides under their registered use patterns. If unacceptable impacts are suspected, the EPA must require additional testing and monitoring under the pesticide registration process. During the registration or reregistration of these compounds, the EPA did not identify impacts to aquatic organisms as a major concern. In fact, the EPA continues to allow the application of some formulations of 2,4-D directly to water. The major surface water concern identified for picloram is the possible contamination of irrigation water and effects downstream on sensitive crops.

Municipal Watersheds

Spraying is proposed in two municipal watersheds above the water system diversion points. These streams are Caribou Creek and Myrtle Creek. The National Toxic Rule has set water quality standards for acceptable levels of compounds in surface water. The acceptable level of 2,4-D for domestic water supplies is 93 micrograms per liter (ug/L). The acceptable level of 2,4-D for waters that support organisms for human consumption is 790 ug/L.

The results of the worst case scenario discussed above were converted to ug/L. Under the worst case scenario, the concentration of 2,4-D for Caribou Creek was 5.1 ug/L and the concentration of 2,4-D for Myrtle Creek was 17 ug/L. Both figures are well below the acceptable level established by the National Toxic Rule. Again it should be emphasized that these calculations represent a worst case scenario and the probability that these concentrations would be reached is very low.

Table 4-3 Herbicide Concentrations mg/L (ug/L) Worst Case Scenario

Drainage	Clopyralid	2,4-D	Dicamba	Picloram
Boulder Creek	0.0068	0.0076	0.0016	0.0020
20 Mile Creek	0.0209	N	0.0111	N
Caribou Creek	0.0005	0.0051(5.1)	N	N
Snow Creek	0.0108	0.0193	0.0541	0.0051
Myrtle Creek	0.0028	0.0170(17)	N	0.0045
Ball Creek	0.0029	0.0189	0.0155	0.0048
Trout Creek	N	0.0524	N	0.0138
Smith Creek	0.0014	0.0477	N	0.0128
Boundary Creek	N	0.0651	N	0.0171
Meadow Creek	N	0.1025	N	0.0287
Grass Creek	N	0.0690	N	0.0181
Saddle Creek	N	0.03478	N	0.0092
N - Herbicide not planned for use in this drainage.				

Best Management Practices

Rule 6 of the Rules and Regulations Pertaining to the Idaho Forest Practices Act Title 38, Chapter 13, Idaho Code pertain to the use of chemicals. The purpose of these rules is to regulate handling, storage and application of chemicals in such a way that the public health and aquatic and terrestrial habitats will not be endangered by contamination of streams or other bodies of water. The rules have generally been adopted by the Forest Service as standard operational procedures.

There is one exception. One rule requires that at least 25 feet be left untreated on each side of all Class I steams, flowing Class II streams and areas of open water. As discussed in Chapter III, there are two locations where treatment of meadow hawkweed is proposed within this zone, Trout Creek and Grass Creek. For these cases, a Request for Forest Practice Variance will be filed with the Idaho State Department of Lands. The request will be to use forms of the herbicide 2,4-D that have been certified for use over water within this zone. The herbicide would not be sprayed directly on water but would be spot sprayed by hand directly on hawkweed plants up to the edge of the water.

In summary, the direct, indirect, and cumulative water-quality impacts of these projects would be minimal. Under reasonable assumptions, it can be concluded that no herbicides would be detected in surface water at the part-per-billion detection limit, if a decision were made to apply herbicides. Effects on aquatic organisms under normal-use scenarios should not be detectable.

The impacts could be more serious in the event of a spill of herbicides directly into a small stream. It is not possible to predict the concentration or duration of contamination in advance. However, a spill could result in localized fish mortality, especially to young fingerlings, or mortality to the early developmental stages of other aquatic organisms. BMP direction will be followed in the case of a spill. Also see spill plan in Appendices.

HUMAN RESOURCES and HUMAN HEALTH

No-Action Alternative

The spread of noxious weeds within the National Forest is likely to have little impact on human health and safety. There are deleterious health impacts on humans. Certain noxious weeds are on County and State noxious weed lists due to there impacts to human health. Human reaction to certain weeds ranges from inducement of allergic reaction to death (as is the case of poison hemlock). Even though there is potential for such impacts, occurances have been few to date.

Some people have a strong emotional response to the prospect of noxious weeds in the National Forest. The possibility of increased spread would likely affect their enjoyment of the forest resources.

Manual Treatment

The impacts to human health and safety from manual treatment are likely to be minor. Possible effects include a variety of sprains, cuts, and skin irritation to the individuals performing the work. It is likely that there would be a high turnover in the workforce doing manual treatment.

Cultural Treatment

The burning of individual knapweed plants presents little risk to human health or safety. There is the chance of minor burns to workers.

Biological Treatment

The release of biological control agents for Canada thistle poses no threat to human health or safety.

Treatment with Herbicides

There is a wide variety of opinions within the general population on the value and safety of pesticides, including the herbicides proposed here. Many people, particularly in rural and agricultural settings, view pesticides as a necessary part of business and, if used properly, a relatively safe tool. Increasingly, however, the risks of pesticide use are being questioned.

The Northern Region of the Forest Service (Region 1) has analyzed the risk of the use of clopyralid, 2,4-D, dicamba, and picloram to control noxious weeds. This analysis is presented in two documents: *Risk Assessment for Herbicide Use in Forest Service Regions 1,2,3,4, and 10 and on Bonneville Power Administration Sites* and *Human Health Risk Assessment fot Herbicide Application to Control*

Noxious Weeds and Poisonous Plants in the Northern Region. This is highly recommended reading for pesticide users and those analyzing projects such as those dicuseed in this document. These documents are incorporated into this EIS by reference and are included as part of the project file. The salient findings of these Risk Assessment are presented below.

The analysis of the human health risk from pesticide use follows the same basic format as outlined under the section on fisheries. The toxicity information is reviewed for the herbicides of interest in order to determine the levels of these chemicals that would be injurious to human health. Exposures and doses that might occur as a result of these projects are then estimated for workers and members of the general public. In the final step, the toxic effect levels established in the first step are compared to dose levels to determine the possibility of health impacts.

A considerable body of test data on laboratory animals is available for these herbicides. Most of these tests have been conducted as a requirement for EPA registration of these compounds for use in the U.S. It should be noted that none of these compounds have completed all tests required for final registration. Current Federal regulations allow for conditional registration pending the completion of all tests and the discovery of no unreasonable adverse affects in the interim. This allowance for continued use before all testing is completed concerns some members of the public and has led to charges that "untested" pesticides are allowed on the market.

All the pesticides analyzed here have been subjected to long-term feeding studies that test for general systemic effects such as kidney and liver damage. In addition, tests of the effects on reproductive systems, mutagenicity (birth defects), and carcinogenicity (cancer) have been conducted. No-observed-effect levels (NOEL) are available for most types of tests. A NOEL is the highest dose in a particular test that did not result in adverse health impacts to the test organism.

Extrapolating a NOEL from an animal study to humans, however, is an uncertain process. The U.S.EPA compensates for this uncertainty by dividing NOELs from animal tests by a safety factor (typically 100) when deciding how much pesticide will be allowed on various foods. This adjusted dose level is referred to as the Acceptable Daily Intake (ADI) and is presumed by the EPA to be a dose that is safe even if received every day for a lifetime.

The ADI is a convenient comparison point for determining the significance of doses that people might receive from these weed-control projects. All doses to members of the general public would be below the ADI for the herbicides of concern. A concern raised occasionally is that persons gather wild foods and could gather foods directly sprayed with herbicide. This would be virtually impossible at any of the spray sites. The only wild foods commonly used are a few huckleberries. Spraying would typically occur about three weeks to two months before the fruit ripened, and plants that were unintentionally sprayed would not develop fruit.

Worker doses for picloram, dicamba, and clopyralid are likely to be below the ADI if reasonable safety precautions are used. The worker doses of 2,4-D could exceed the ADI, but the risks would be very small because the spraying would take only a few weeks per year and the ADI assumes a lifetime of doses.

There is the possibility of idiosyncratic responses such as hypersensitivity on the part of a small percentage of the population. These persons are generally aware of their sensitivities since they are typically triggered by a variety of natural and synthetic compounds. Such persons would not be permitted to work on the spray crews.

The issue of delayed effects of low levels of chemical exposure is raised by some people. Principal among these effects is cancer. All of these herbicides have undergone testing for cancer. Clopyralid and dicamba tests have shown no evidence of cancer initiation or promotion. The evidence for 2,4-D and picloram has been more widely debated. Current evidence is mixed, and these compounds seem at most weakly carcinogenic. Appendix B contains a letter from Dr. John Graham of the Harvard University School of Public Health that summarizes the current evidence on 2,4-D. As noted in the letter, the weight of evidence that 2,4-D is a carcinogen is not strong, and even if it is ultimately shown to be an animal carcinogen, it is unlikely to be a very potent one.

Nonetheless, the Risk Assessments cited above assume that the two herbicides are carcinogens. These analyses also assume that any dose of a carcinogen could cause cancer and that the probability of cancer increases with increasing dose. Estimations of the probability of developing cancer from exposure to these compounds are based on a conservative extrapolation from cancer rates in animals subjected to the chemical over a lifetime. The projected cancer rates are highest for workers since their doses are highest. Even here the risks seem relatively low compared to other commonly encountered risks. For example, one round-trip transcontinental air trip carries with it an increased risk of cancer from cosmic rays on the order of 1 in a million. A similar increased risk of cancer accumulates from living in Denver for 1.5 months compared to living at sea level, again because of cosmic rays. Smoking 2 cigarettes increases the risk of cancer by 1 in a million, as does eating 6 pounds of peanut butter (due to aflatoxin exposure). Cancer probabilities of workers would increase by about 1 in a million after spraying 2,4-D for 137 days or spraying picloram for about 11,000 days. Since the average American has about a 1 in 4 chance of developing cancer in his or her lifetime, the cumulative impact from spraying at the rates proposed would not be significant.

Concerns are occasionally raised about the cumulative and synergistic interactions of the pesticides and other chemicals in the environment. Synergism is a special type of interaction in which the cumulative impact of two or more chemicals is greater than the impact predicted by adding their individual effects. The Risk Assessments referenced above address the possibility of a variety of such interactions. These include the interaction of the active ingredients in a pesticide formulation with its inert ingredients; the interactions of these chemicals with other chemicals in the environment; and the cumulative impacts of spraying proposed here and other herbicide spraying the public might be exposed to.

The basic conclusions are as follows: We cannot absolutely guarantee the absence of a synergistic interaction between the pesticides examined here and other chemicals to which workers or the public might be exposed. It is possible, for example, that exposure to benzene, a known carcinogen that comprises 1 to 5 percent of automobile fuel and 2.5 percent of automobile exhaust, followed by exposure to any of these herbicides could result in unexpected biochemical interactions. Testing the virtually infinite number of chemical combinations would be impossible.

There are a number of reasons to expect that synergistic or other unusual cumulative interactions would be very rare. Ames (1983) pointed out that many naturally occurring chemicals in the food people eat are teratogenic, mutagenic, and carcinogenic, and they are consumed at doses 10,000 times higher than man-made herbicides. Therefore, the low, short-lived doses that would result from spraying these herbicides are very small compared to many other chemicals in the environment. For these relatively small doses, a synergistic effect is not realistically expected (Crouch et al. 1983). The EPA came to a similar conclusion in a discussion entitled *Guidelines for the Health Risk Assessment of Chemicals (Federal Register September 24, 1986)*. They suggest in their discussion of interactions (synergistic or antagonistic effects) that "there seems to be consensus that for public health concerns regarding causative (toxic) agents, the additive model is more appropriate (than any multiplicative model)."

In summary, although ironclad guarantees cannot be given, we would reasonably expect that the human health impacts from herbicide applications on these sites would be insignificantly small.

RANGE

No-Action Alternative

The increasing spread of noxious weeds would lead to a reduction of available forage for both livestock and wildlife.

Manual and Cultural Treatment

Assuming that these treatments could prevent the spread of noxious weeds, there would be no impact from this alternative on range resources. dIf, as expected, funds are not adequate to implement this alternative, weeds would continue to spread, and the impacts would be similar to the no-action alternative.

Cultural Treatment

Impacts could be similar to the manual alternative if weeds continued to spread.

Biological Control

Assuming that biological control of Canada thistle did diminish the competitive advantage of this species, there should be no impact from this alternative on range resources. If the method is ineffective, then other alternatives would have to be considered.

Treatment with Herbicides

The use of herbicides could greatly reduce the probability of the spread of weeds. As noted in the Risk Assessments cited in the section on Human Health, feeding studies with cattle have shown low toxicity for these compounds. Toxicity levels are well above those levels that would be encountered by packstock eating treated grass. Feeding studies are not available for horses, but common observation of horses grazing in treated areas indicates no effect from these herbicides.

RECREATION

No Action Alternative

The spread of noxious weeds could negatively impact the recreational use and enjoyment of the Cabinet, Purcell, and Selkirk Mountain Ecosystems. For many people the presence of noxious weeds is evidence of negative human impact and neglgence in stewardship of natural resources..

Manual and Cultural Treatment

If these treatments were vigorously implemented to prevent the spread of weeds, they would prevent the negative impacts of exotic species on recreational opportunities.

A complete program of manual and cultural treatment, would require the labor of about 170 individuals over an 88 day period. A workforce of this size would significantly affect wilderness solitude of recreationists. The magnitude of this program would significantly affect the condition of trails, campsites, range, and other physical and biological resources.

Biological Treatment

The release of biological control agents would have no direct impacts on recreational opportunities. If the method is successful in reducing the impact of Canada thistle, then it could have some positive indirect effect on recreational opportunities.

Herbicide Treatment

Treatment with herbicides could greatly decrease the likelihood of the spread of non-native vegetation to the Selkirk and Cabinet Mountain Ecosystems on the Bonners Ferry Ranger District thus minimizing the weeds' impact on recreation. However, the treatment itself could affect recreational users, particularly during the short period of time during which treatment would occur on these sites.

The visual impact of spraying would be quite temporary and on most sites would only last a few hours or less.

Once the spraying was completed, the evidence of spraying would not be obvious. The sprayed weeds would begin to yellow and wither, but the process would not look much different from the natural wilting of plants that are going dormant.

SOILS and GROUNDWATER QUALITY

Non-chemical Alternatives

As noted in the section on fisheries, there is some evidence that erosion rates are higher on knapweed-infested ground than on native grassland sites.

The non-chemical alternatives would have no significant impact on groundwater quality.

Treatment with Herbicides

The soil characteristics of a site are an important consideration in the decision to use herbicides. As noted in the section on soils in Chapter 3, three characteristics are particularly relevant: the percent organic matter of the soil, the available water capacity of the soil, and the permeability of the soil.

When incorporated into the soil, part of the herbicide dissolves in the soil moisture and part adsorbs onto soil particles, primarily organic matter and fine particles. The amount of herbicide adsorbed onto soil particles depends on the characteristics of the chemical and on the amount of organic matter and

fine material in the soil. Any herbicide that remains in soil water is available for uptake by plant roots. However, if the water moves off-site or out of the rooting zone it takes some of the dissolved herbicide with it. The distance of travel and the concentration of the herbicide determine whether this herbicide movement is a problem.

All the herbicides analyzed here have some soil activity, that is, they dissolve to some extent in water and can be adsorbed fairly readily from soil moisture by susceptible plants. These herbicides can move with water as it moves through soil.

Although these herbicides are all water soluble and soil active to some extent, they vary significantly in persistence in the environment. As we discussed in Chapter 2, persistence is not necessarily a negative characteristic when combatting noxious weeds, provided the mobility of the chemical is controlled. These species all produce many seeds that remain viable in the soil for long periods and many species have rhizomes not directly contacted by the spray. Long-term control control requires either multiple applications of low-persistence chemicals or less frequent applications of more persistent chemicals. The critical element to consider is whether a more persistent chemical such as picloram can be held on the site to do the job it is intended to do.

Since these chemicals can move with water, we must consider the permeablilty and water-holding capacity of the soil on a site. These properties determine how much water moves through the soil into groundwater or surface water after rainfall. If the soil retains a large quantity of water in its upper horizons for later use by plants, the water and partially dissolved herbicide will have little opportunity to move. In contrast, if a soil is highly permeable and has little water-holding capacity, moisture passes through the soil rapidly and carries some of the herbicide with it.

In many areas of northern Idaho and western Montana, soils retain almost all precipitation within the upper 2 feet of soil. Research on a prairie site in Missoula County found no picloram below 20 inches soil depth (Watson et al 1989). The minimum detection limit in this study was 10 parts per billion. On a forested site with coarser soils and precipitation rates more comparable to sites analyzed here, this study found picloram levels ranging from 205 to 366 parts per billion in the upper 5 inches of soil after an application of 1 pound of picloram per acre. A maximum concentration of 24 parts per billion was detected at soil depths between 30 and 40 inches. No picloram was measured in shallow groundwater wells with a detection limit of 0.5 parts per billion.

Studies on picloram soil concentrations have included comparisons of picloram, 2,4-D, and clopyralid. Results reported by Rice and his coresearchers (1992) confirm that 2,4-D and clopyralid are less persistent than picloram. Clopyralid was not detected at any time below 10 inches soil depth and, after 30 days, 2,4-D was not detected below 2 inches soil depth. Picloram was detected in the 10 to 20 inch soil strata within 30 days of spraying, but was not detected below 10 inches soil depth one or two years after spraying. Detection limit in this study was about 10 parts per billion.

Dicamba was not directly investigated in these studies, but its persistence and mobility properties are in the range of 2,4-D and clopyralid (see review in USDA 1984).

VEGETATIVE COMMUNITY DIVERSITY

No-Action Alternative

Under this alternative the knapweed, Canada thistle,hawkweed, dalmation toadflax, skeleton weed, goatweed, and other noxious weed infestations would be allowed to expand without interference. It is likely that new infestations would occur as animals and humans move seeds or plant parts to new locations.

As these noxious weeds spread, the negative impact on the diversity of native vegetation would become more apparent. Several researchers have also demonstrated that the number of native species, not just their total biomass, decreases on sites infested by noxious weeds. Belcher and Wilson (1989) found 7 to 11 species outside leafy spurge infestations but only 4 species where leafy spurge was most abundant. Tyser and Key (1988) reported significant reduction in species richness and diversity in knapweed infested fescue grasslands surveyed in Glacier National Park.

Manual and Cultural Treatment

With sufficient commitment of dedicated labor it is possible to eliminate some noxious weed species such as knapweed, houndstongue, and goatweed from a site with manual and cultural treatments. These plants can be killed if enough of the tap root and lateral roots are removed. However, these plants are prolific seed producers, and seed reserves in the soil can remain viable for more than ten years. The disturbed ground around pulled plants provides a very good seedbed for the germination of seeds. Thus hand pulling would have to continue over many years to be effective.

Native species could be effectively restored on these sites with a diligent program of manual and cultural control of these species. In addition, control of these species on these sites would eliminate their spread to other areas.

Canada thistle is one exception. This species has an extensive root system and sends out new shoots from numerous buds on lateral roots. Three or more pulling sessions per year may reduce the competitive advantage of the Canada thistle. However, Canada thistle could not be eliminated from these sites with manual or cultural treatment. The infestation could continue to fill in through vegetative reproduction in spite of a rigorous hand pulling program. The composition of native species would continue to be affected, although some recovery could be anticipated. If conscientiously applied, manual treatment could also greatly reduce or eliminate seed production. The greatest risk with manual and cultural treatment of Canada thistle is that the infestations would continue to spread vegetatively.

Biological Control

The impacts of the introduction of biocontrol agents on Canada thistle are difficult to predict. Although *Urophora cardui* and *Ceutorhynchus litura* are reported to reduce Canada thistle densities on some sites by as much as 80 to 90 percent(Rees 1992), it is not certain that these insect species will adapt to the climatic and site conditions in these areas. In some cases noxious weed species have adapted to conditions outside the habitat range of potential biocontrol agents.

If these insect species do adapt to site conditions in north Idaho, they could reduce the density of these infestations of Canada thistle. Canada thistle would likely continue to spread slowly through suitable habitats; however, its competitiveness against native species would be greatly reduced. If the insect species did not establish on these sites within a reasonable timeframe or did not flourish once established, other alternatives, including the no-action alternative would have to be considered.

Before introducing new biocontrol agents into this country the agent's host-specificity must be tested. These biocontrol agents are tested against a wide variety of plant species under "eat-or-starve" conditions to ensure that their attack is confined to a narrow range of plant species and preferably only the weed of concern. Both of these insects were tested for host-specificity. *U.cardui* showed a very narrow range of attack. When tested against seventeen closely related members of the composite, the insect laided eggs virtually only on Canada thistle (Peschken and Harris 1975). The only other incidents of egg laying were 1 of 21 females that oviposited on a bull thistle (*Cirsium vulgare*) and 1 of 21 females that oviposited on a plumeless thistle (*Carduus acanthoides*). Both of these thistle species are also non-native.

Ceutorhynchus litura has a somewhat broader host range than *U. cardui*. It will attack a wider variety of plant species of *Cirsium, Silybum*, and *Carduus* (Zwolfer and Harris 1965). There exist several native species in Montana that belong to the *Cirsium* genus. As this insect species spreads, it could affect the populations of these species in some areas, but it is unlikely to cause their extinction. At the present time there are no sensitive *Cirsium* species on the Bonners Ferry Ranger District.

Biological control agents will not erradicate a target or non-target plant species. Rather, under ideal circumstances the control agents will reach a dynamic equilibrium with the plant species.

Control with the Herbicide Picloram

Herbicides such as picloram and 2,4-D are often perceived as greatly reducing the diversity of plant species on a spray site. For example, picloram is thought to create a grass monoculture at the expense of broadleaf species. This generality is somewhat overstated.

Two studies have been conducted in western Montana to measure the impact of herbicide application on native species. Willard et al. (1988) measured the impact of picloram on native grasses and broadleaf species. With the control of noxious weeds, the grass species generally showed marked increases. Likewise some broadleaf species such as arnica and yarrow were greatly reduced (see Appendix E for scientific names). Generally, members of the asteraceae (composite family), fabaceae (legume), polygonaceae (buckwheat), and apiaceae (parsley family) were affected by picloram. In contrast, members of the brassicaceae (mustard family), liliaceae (lily family), and scrophulariaceae (figwort family) were less affected by the spray.

In a more extensive study, Rice *et al* (1992) compared the impacts of the herbicides 2,4-D, picloram, and clopyralid to the impact of knapweed invasion on species number and diversity. The knapweed sites were in the initial stages of infestation, thus the diversity on these sites had not suffered as noted in the studies cited above by Tyser and Key (1988). Although the untreated knapweed plots in Rice's study started with slightly higher numbers of species and diversity (by luck of random draw), within two years after spray the species number and diversity were virtually identical on all plots. Initially the impact to species was greater on sites sprayed with picloram than on sites sprayed with clopyralid.

Clopyralid affects members of only three plant families, the composites, the legumes, and the buckwheats. Thus this herbicide can be sprayed near tree, shrub, and forb species that might otherwise be affected by picloram.

Aside from the on-site impacts to vegetation that might occur from herbicide application, these treatments have the benefit of protecting sites that are currently uninfested by reducing the sources of further infestation. As discussed in the section on the impacts of the no-action alternative the spread of these aggressive exotic species could significantly impact the vegetative diversity on sensitive sites in the Selkirk and Cabinet Mountain Ecosystems. Although herbicide application could have small and transitory impacts on the vegetation on treated sites, it would prevent much more serious, long-term effects on many thousands of susceptible acres in these Ecosystems.

Cumulative Impacts on the Vegetative Diversity

As discussed under the no-action alternative, the failure to control noxious weeds on these sites tends to increase the probability that noxious weeds will spread to new sites. Likewise, the probability of weed spread would increase across sites on which weeds are only partially controlled, for example, through manual treatment. The probability of further spread is compounded as weeds spread to new sites. This compounding of probabilities occurs because the new sites contribute to the probability of spread. Thus, in the same way that money in a bank increases more rapidly through compounding of interest, weed populations can increase rapidly through compounded spread. This, in large part, accounts for the explosive increase in certain weed populations in northern Idaho.

By contrast, the impacts of alternatives such as herbicide spraying on vegetative biodiversity tend to be much more easily confined to the site of application. Although herbicides could affect some plant species on the site of application, by preventing the spread of weeds their overall impact would be positive. Impacts on vegetative diversity would be purely additive across the relatively few acres that are sprayed.

WILDLIFE AND THREATENED AND ENDANGERED SPECIES

No-Action Alternative

The no-action alternative would have no direct impact in the short term on either threatened and endangered species or on wildlife species in general. The spread of noxious weeds could affect the habitat for many wildlife species, however, in the long term as more native habitat is replaced or reduced by noxious weeds. The listed species most affected by this would be herbivorous, such as grizzly bear, and wolves who depend on prey that are herbivorous. Of particular concern is the impact on grazing animals such as deer and elk.

As noted in the previous section on vegetative community diversity, noxious weeds can effectively supplant native vegetation on infested sites. Although there are reports of deer and elk eating knapweed (Willard et al 1988), it is definitely not a preferred forage. A Forest Service assessment of spotted

knapweed infestation on winter range in the Lolo Nationa Forest predicted a loss of 220 elk annually by 1998. This would reduce the ability of the area to support gray wolves as well, and if infestation were to become extreme could affect their populations.

Grizzly bears could have a reduction in succulent vegetative forage if sites were overrun by noxious weeds. Grizzly bears are not limited by forage quality or quantity in either ecosystem, so the effect would probably not be a significant factor in recovery of this species in the forseeable future. Bears are forage opportunists, and would probably be able to survive well even with a severe infestation.

Woodland caribou and bald eagle would not be affected by the spread of noxious weeds. Caribou are ungulates, but their diet is very different from elk and deer, and would be unlikely to be directly or indirectly affected.

Sensitive wildlife that depend on habitat features that are not immediately affected by noxious weed contamination would not be likely to be directly affected. Such species as black-backed woodpecker, flammulated owl and boreal owl depend more on snags than on ground vegetation. Species associated with water such as common loon, CdA salamander and harlequin duck would not be affected because of the precautions noted for water quality; they are not dependent on the vegetation affected by noxious weed spread. Northern bog lemmings, which are associated with bogs but also occur in old growth moist forests, would be unlikely to be directly affected for the same reasons.

Carnivores such as wolverine, fisher and lynx could be indirectly affected by noxious weed spread in much the same way as wolf is, ie, the herbivore prey they depend on could be reduced in number and kind by noxious weed spread. Of these species, fisher would be least affected because they are most dependent on older forests with dead and down material rather than an herbivorous understory.

Townsend's big-eared bat is apparently limited by lack of suitable habitat in our area, ie suitable caves or mine adits. No alternative would have any direct, indirect, or cumulative effect on this situation.

Management indicator species would be affected in the same types of ways as the above species. White-tailed deer would be most directly affected by the no action alternative of allowing the spread of noxious weeds, because its vegetative forage base would be altered. Pileated woodpecker and pine marten would be least affected by the spread of noxious weeds because their habitat is primarily large timbered stands that are not favored by any noxious weed under consideration at this time. Goshawks are predators of a number of animal species, some of which are herbivores and could be adversely affected by the spread of noxious weeds.

Other groups of fauna such as neotropical migrant birds would be affected differently depending on their habitat needs. In general, the herbivorous or granivorous species would be most affected by the spread of noxious weeds in the same way as the other species above. Least affected species would be those dependent on large timber or water-related habitats, or whose habitat did not overlap those sites prone to infestation by weeds.

Overall, to all the above species, the greatest effect of no action would be the change in biodiversity from native plant species upon which the native fauna depends. This is a serious concern that probably would affect some species in a much more impactive way than others, and not in necessarily predictable ways. The cumulative effects to all these species from the loss of biodiversity from noxious weeds; fragmentation from roading, timber harvesting and rural development; fire suppression; increased direct human presence from recreation and other forest activities; and other human influences, generally will make it favorable for those species which are generalists to survive at the expense of specialists. Most of the "emphasis" species listed above are specialists, and noxious weed infestation is thus a part of the cumulative effects which would make it less easy for those species to thrive.

<u>Other Non-chemical Alternatives</u>

The other non-chemical alternatives would have no direct affect on wildlife. If these alternatives allowed the continued spread of noxious weeds, they could have the indirect effects outlined above for the no-action alternative.

<u>Treatment with Herbicides</u>

Direct effects to wildlife from the application of these herbicides on these sites should be negligible

based on the discussion below. None of the herbicides proposed here bioaccumulate in wildlife in concentrations greater than their general environmental concentrations. By contrast, concentrations of some organochlorine pesticides such as DDT in some wildlife species could be as much as 100,000 times higher than the concentrations in the general environment because these chemicals bioaccumulate.

Inferences of possible effect can be made by comparing the exposure levels wildlife would experience with the concentrations that elicit toxic responses in wildlife. As discussed in the Risk Assessments referenced above in the section on Human Health, immediately following an application of 1 pound of herbicide per acre the herbicide concentration on grasses and small forbs would be about 125 parts per million. Within 90 days the concentration of picloram on vegetation would be about 25 parts per million (Watson et al. 1989). The concentrations of 2,4-D, dicamba, and clopyralid would likely be less because of their faster breakdown rates.

The avian toxicity of these herbicides is extremely low (USDA Forest Service 1984 in Spotted Bear Ranger District, Project File). The picloram LC_{50} for mallard ducks and quail is in excess of 10,000 parts per million (highest dose tested.) Comparable values for clopyralid are 4,640 ppm (highest dose tested), for dicamba in excess of 10,000 ppm (highest dose tested), and for 2,4-D amine in excess of 5,000 ppm. Feeding studies involving rodents also indicate similar values for these herbicides. These values all indicate very low toxicity.

Feeding studies on grazing animals also confirm the low toxicity of these herbicides. Deer that were fed foliage treated with 2,4-D at up to 4 times the rate proposed here showed no ill effects (Campbell et al. 1981). Cattle fed picloram-treated hay with concentrations 20 times and greater than those expected on the proposed sites suffered no lethal effects (Monnig 1988). Heifers fed dicamba at 20,000 ppm in feed showed no ill effects (Edson and Sanderson 1965). Clopyralid feeding studies with grazing animals are not available but would likely be similar to picloram, which is a close chemical analogue.

Comparisons of the expected environmental concentrations with the toxicity levels of these herbicides indicates that effects on birds, rodents, and grazing animals are not expected. In addition, the scientific evidence reviewed in the Human Health Risk Assessment indicates that these herbicides are quickly excreted by exposed animals. Thus, effects on predators such as wolves or on raptors such as eagles or falcons are not reasonably expected. Because these herbicides do not bioaccumulate, the cumulative impacts of spraying sites inside and outside the National Forest would be insignificant.

Direct effects to species not affected by habitat loss from weeds are negligible based on the rationale above.

Indirect effects to wildlife from chemical treatment would be primarily from disturbance from the spray and survey crews. This effect would be most noticeable on grizzly bears, wolverine and goshawk. Administrative use guidelines for any motorized use behind gates would be implemented, so the effects of disturbance would be controlled to acceptable levels with regard to grizzly bears. Disturbance to the other species would be no greater than that of other forest level activities.

Cumulative effects of herbicide treatment may be considered as above.

PROBABLE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

The application of herbicides brings with it the likelihood of some environmental impacts that cannot be avoided. These have been discussed above and would primarily involve non-target plants. Although mitigation measures would probably prevent environmentally significant concentrations of herbicide from reaching surface water or groundwater, it is possible that minute amounts of herbicide will migrate from the site. Under reasonably foreseeable circumstances this would not have a significant environmental impact.

The adoption of the no-action alternative or any of the non-chemical alternatives would not immediately result in unavoidable environmental impacts. However, it is clear that alternatives which allow the continued spread of noxious weeds would eventually result in unavoidable environmental effects. Although the infestations are containable now and could theoretically be eliminated at any time in the future, after infestations reach a "critical mass" they are uncontrollable in any practical sense. This situa-

tion is well illustrated by the knapweed infestations in many areas of northern Idaho. At the "point of no return," the adverse environmental impacts outlined above for the no-action alternative would be unavoidable.

POSSIBLE CONFLICTS WITH THE PLANS AND POLICIES OF OTHER JURISDICTIONS

The Idaho Noxious Weed Law directs the county control authority to make all reasonable efforts to develop and implement a noxious weed program.

The lack of weed control under the no-action alternative would conflict with State and county weed control plans and policies. The other alternatives would indicate that the Forest Service is serious about doing something about the "weed problem."

None of the alternatives would conflict with State and Federal water or air quality regulations or with U.S. Fish and Wildlife Service recovery plans for threatened and endangered species. Appendix F contains a biological assessment of the possible impacts of the preferred alternatives on threatened and endangered species.

THE RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

None of the alternatives would involve the short term use of commodity-type resources. Some might argue, however, that the impact of herbicide spraying on non-target plant species constitutes a short-term use of the resource.

As discussed above, the more effective an alternative is at controlling the spread of noxious weeds, the better that alternative is at protecting the natural resources of this area despite the possible short-term impacts on the environment.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

All of the alternatives that involve active control measures would involve an irretrievable commitment of labor, fossil fuels, and economic resources. The no-action alternative would not involve such commitments, but it could result in the unavoidable deterioration of the natural condition of the area. The no-action alternative would likely irretrievably change the existing plant community diversity.

CHAPTER V

SUMMARY OF PUBLIC COMMENTS

INTRODUCTION

This chapter includes:

1) a brief description of issues and of public participation prior to and following publication of the DEIS,

2) a brief description of public comments on the DEIS,

3) a summary of the public comments and agency responses, and

4) photocopies of the letters and summaries of all calls from all commentors to the DEIS and agency responses to each.

ISSUES AND PUBLIC PARTICIPATION

Public comment was formally solicited with a notice published in the Federal Register that indicated that the Bonners Ferry Ranger District's intent to prepare an EIS on noxious weed management. News releases were published in several local papers and presented as radio announcements to solicit public input on weed management.

Analysis of public and internal input resulted in a list of three issues that guided the development of the alternatives. These issues are:

1. What are the potential impacts of noxious weeds on resources such as the ecological community and processes; threatened, endangered, sensitive plants and animals; soils; water quality; aesthetics; wildlife and fish; and recreational opportunities?

2. What are the potential impacts of weed control methods on other forest resources as listed in issue 1?

3. How would the weed management methods, particularly herbicide application, affect human health?

PUBLIC RESPONSE TO THE DEIS

The DEIS was released in June of 1995. Copies were distributed to any group or individual who had expressed an interest in noxious weed control and to other potentially interested parties. Copies of the DEIS were available for review at several Forest Service offices. Local newspapers and the radio stations in Boundary and Bonner Counties provided news coverage of the DEIS. The Bonners Ferry Ranger District received comments from 8 individuals, organizations, or government agencies.

Most respondents supported an active program to control noxious weeds. Most of them supported the preferred alternative identified in the Draft EIS. In a number of comment letters a general support was offered for the Forest Service noxious weed control program with an implicit support for the Forest Service preferred alternative.

The EIS was revised, where appropriate, to reflect comments received from the public. Very few substantive changes were needed. Some wording changes have been made to clarify issues raised in comments on the DEIS. These changes are noted in the responses to individual comment letters. Copies of all written comments, with individual responses, are reproduced and made part of this chapter.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 600
Portland, Oregon 97232-2036

IN REPLY REFER TO

August 21, 1995

ER 95/0506

Debbie Henderson-Norton, District Ranger
Bonners Ferry Ranger District
Idaho Panhandle National Forests
Route 4, Box 4860
Bonners Ferry, Idaho 83805

Dear Ms. Henderson-Norton:

The Department of the Interior (Department) has reviewed the Draft Environment Impact Statement (DEIS) for the Noxious Weed Management on the Bonners Ferry Ranger District, Idaho Panhandle National Forests, Boundary County, Idaho. The following comments have been prepared pursuant to the National Environmental Policy Act, Migratory Bird Treaty Act, and the Endangered Species Act of 1973, as amended, and are provided for your use and information when preparing the final documents.

GENERAL COMMENTS

The Department generally supports the integrated pest management approach which this project proposes for weed control. This approach consists of mechanical, cultural, biological, and chemical control measures. We agree that potential adverse impacts to fish and wildlife resources resulting from the proposed action would be relatively limited, compared to long-term impacts associated with the uncontrolled spread of noxious weeds in the project area.

1 With respect to minimizing potential impacts associated with the use of herbicides, we incorporate, by reference, the comments included in the Fish and Wildlife Service's (Service) February 13, 1995, letter (copy enclosed) addressing the Notice of Intent for this project.

SPECIFIC COMMENTS

Page 3-4. Bull Trout Under the "Bull Trout" heading, the following two corrections should be made:

* The DEIS states that bull trout is considered a "Category C1 species under the Endangered Species Act." As a point of clarification, the bull trout is considered a category 1 candidate species, or C1 candidate species. Candidate species are placed in one of three categories: Category 1, Category 2, or Category 3.

(2)

* The DEIS indicates that: (1) on June 8, 1994, the Service decided that the bull trout is warranted, but precluded from listing, and (2) on February 6, 1995, the Service changed the bull trout status to warranted and is in the process of drafting regulations. These statements are both incorrect. On June 10, 1994, the Service published a notice of petition finding (59 FR 30364) that determined that listing the bull trout was warranted, but precluded due to other higher priority listing actions. On June 12, 1995, the Service published a 12-month recycled petition finding (60 FR 30825), indicating that listing the bull trout is still warranted but precluded.

(3) Westslope Cutthroat Trout The DEIS indicates the westslope cutthroat trout is listed as a "Category species". As a point of clarification, the westslope cutthroat trout is currently considered a category 2 candidate species.

(4) Appendix E The clarifications and corrections provided also apply to the descriptions of the bull trout and the westslope cutthroat trout in the Sensitive Fish Biological Evaluation.

We appreciate the opportunity to comment.

Sincerely,

Charles S. Polityka

Charles S. Polityka
Regional Environmental Officer

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Northern Idaho Field Office
11103 E. Montgomery Drive, Suite #2
Spokane, WA 99206

February 13, 1995

Ms. Debbie Henderson-Norton
District Ranger
Bonners Ferry Ranger District
Route 4, Box 4860
Bonners Ferry, Idaho 83805-9764

Subject: Notice of Intent to Prepare an Environmental Impact Statement for Noxious Weed Treatment on the Bonners Ferry Ranger District (105.0200) ER# 95/0025

Dear Ms. Norton:

The U.S. Fish and Wildlife Service (Service) is writing in response to the subject Notice of Intent (NOI), dated December 30, 1994 and received in our office February 3, 1995. The proposed project involves an integrated pest management approach to weed control which includes mechanical, biological, and chemical control. These preliminary scoping comments are made pursuant to the National Environmental Policy Act (NEPA), Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, and the Endangered Species Act.

1. Endangered Species - The analysis area for the proposed project includes the recovery areas for the endangered woodland caribou (<u>Rangifer tarandus caribou</u>) and the threatened grizzly bear (<u>Ursus arctos horribilis</u>). Your documentation for the project should include a list of threatened, endangered, and candidate species which occur in the treatment areas. You should ensure that the application activities will not threaten the continued existence or preclude recovery of any listed, proposed, or candidate species.

2. Water Quality - The Service is concerned with water quality impacts of the proposed project, particularly with respect to their effects on resident fisheries such as bull trout and westslope cutthroat trout. The activities should not result in any degradation of water quality, aquatic habitat, and wetlands in the analysis area or downstream. The Service is particularly concerned where the water table is high or where leaching or surface runoff is likely.

Application of herbicide sprays should not occur within 200 feet of reservoirs, lakes, ponds (livestock and recreational), pools left by seasonal streams, springs; or within 100 feet of perennial flowing streams and rivers, and wetlands (e.g. swamps, bogs, marshes, and potholes). Ground applications of solid herbicides (e.g. crystals, pellets) have a minimum buffer of 50 feet from all flowing waters. A distance of less than 50 feet to within 20 feet of flowing water may be considered depending on site specific factors.

3. Migratory Birds - The Service also has concerns with project effects on bird species protected under the Migratory Bird Treaty Act (MBTA), which prohibits the take of migratory birds, nests, eggs, and nestlings. Use of herbicides may have detrimental effects on various bird species, particularly insectivorous, herbivorous, and granivorous (seed eating) species. Efforts should be made to protect migratory birds and their habitat.

4. Fish and Wildlife - Short- and long-term impacts of the proposed project on fish and wildlife and their habitats should be given full treatment in the EIS prepared for this project. Specifically, we suggest that you consider incorporating the following points in the proposal:

AUG 17 1995

To minimize drift and volatilization, do not spray when wind velocities exceed 7 mph, rain or other precipitation is falling or is imminent, weather is foggy or is creating unstable air turbulence (normally when air temperatures exceed 80 degrees Fahrenheit) that may seriously affect the normal spray pattern, and temperature inversions could lead to offsite movement of spray. Weather conditions in operation areas should be monitored by trained personnel before and during application. Operations should be immediately suspended anytime it appears that weather conditions could jeopardize safe placement of spray on target areas. Also, the prescribed nozzle pressure as recommended should be used. Some applicators increase nozzle pressure creating molecule-like droplets that drift in any air movement.

o Conduct all mixing, loading, and unloading in an area where an accidental spill will not contaminate soils and streams or other water bodies. If monitoring water is planned, this should be done according to a sampling schedule designated in approved plans before, during and after treatments and make the results readily available to state and local public health and water resources agencies and the general public. Careful consideration of the toxicity of mixtures of herbicides is also essential because interaction between herbicides may increase their toxicity. These synergistic effects of various formulations have not been well documented. Toxicity and persistence in the environment of carrier solvents (e.g. diesel oil, kerosene, mineral oil, limonene) should also be assessed, along with the associated potential for impacts to fish and wildlife resources and their habitats.

o Preventative measures may in the case of some types of exotic plants be the only realistic management. Many exotic herbs, for example, will reinvade disturbed areas following removal efforts and will continue to outcompete native species on badly trampled sites. It is therefore, extremely important to encourage the re-establishment of native vegetation. For example, an area (e.g. overgrazed meadows, campsites) may be closed to reduce trampling and allow re-establishment of native species after exotics are removed. In severely disturbed areas, or those previously dominated by exotics, planting may be used to speed succession, to prevent soil erosion, and to change local environmental conditions.

Exotic plant management programs cannot be one-time efforts. To be successful, these programs must be long-term, incorporating control efforts into routine resource management efforts. A monitoring program to evaluate the ongoing status of exotic vegetation is vital to successful control. Periodically, a reassessment of the type, number, location, and distribution of "pest" species should be made. Information collected could also be used to evaluate the success of control measures and removal techniques.

The Service appreciates the opportunity to provide comments on the subject proposal. We will participate in formal scoping and review of the EIS for this project as funding and time allow. For further information, please contact Suzanne Audet of my staff at (509) 891-6839.

Sincerely,

Robert J Hallock

Robert J. Hallock
Field Supervisor

cc: FWS, Portland - Dunn
FWS-ES, Boise
IDFG R1, CdA

Response to US Department of Interior (Charles Polityka) letter received August 23, 1995.

1. The comments from the US Fish and Wildlife Service of February 13, 1995 were considered and addressed in the preparation of the Draft EIS.

2. The corrections you have identified have been incorporated into the Final EIS text.

3. The correction you have identified has been incorporated into the Final EIS text.

4. The corrections you have identified have been incorporated into Appendix E of the Final EIS.

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District.

KOOTENAI COUNTY
NATURAL RESOURCES PROTECTION

[redacted]

11140 AIRPORT DR. • HAYDEN, IDAHO 83835 • PHONE (208) 772-9239 • FAX (208) 762-3095

August 3, 1995

Bob Klarich
Interdisciplinary Team Leader
Bonners Ferry Ranger District
Rt 4 Box 4860
Bonners Ferry, ID 83805

Dear Bob:

After reviewing your draft Environmental Impact Statement, Noxious Weed Management Projects, my overall impression is that this document is quite comprehensive and thorough. I have only two comments to make it more complete:

1. There was no mention of deleterious health impacts on humans from noxious weeds. Poison hemlock (Conium maculatum) was, of course, used by the ancient Greeks to put Socrates to death. Also, leafy spurge (Euphorbia esula) has toxic sap and spotted knapweed (Centaurea maculosa) induces allergic reactions in some people (to name just three examples).

2. No negative impacts to wetlands or riparian areas by noxious weeds were discussed. Purple loosestrife (Lythrum salicaria) crowds out cattails and other native wetland plants; reportedly even fauna, such as song birds, leave once purple loosestrife becomes dominant since habitat for them no longer exists there. The hawkweeds also can crowd out native grasses in alpine meadows as well as in bottom lands, reducing or eliminating winter range for large herbivores; what hawkweed does to smaller fauna is undocumented.

Regarding the list of approved herbicides, I would suggest you add the very selective, environmentally friendly chemical triclopyr; the trade name is Garlon and it is very useful, especially in riparian areas.

Sincerely,

Frank Frutchey

Frank Frutchey
Superintendent

Response to Kootenai County Natural Resources Protection (Frank Frutchi) letter received August 4, 1995.

1. Your comment that some noxious weeds can have deleterious health impacts on humans is true. We have expanded the discussion of human health in Human Resources and Human Health in Chapter 4.

2. Fortunately, at this time on the Bonners Ferry District we do not have a population of purple loosestrife (Lythrum salicaria). There are only two small sites where wetlands/riparian areas are affected by noxious weeds and treatment with herbicides is identifed. At this time, the herbicides identified in this document used per label instructions should not pose a threat to the sites treated. This document is oriented to site specific projects, and as such had to address how to treat the sites currently needing our attention. If in the future there was a need to deal with a noxious weed problem involving significant wetland and or riparian areas, such site(s) would also be reviewed for site specific action. It is logical to assume that the herbicide triclopyr would be considered at that time.

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District.

RECEIVED

Boundary County Noxious Weed Control

Box 267

Bonners Ferry, Idaho 83805

August 14, 1995

Debbie Henderson-Norton District Ranger
Bonners Ferry Ranger District
Rt 4 Box 4860
Bonners Ferry ID 83805

Dear Debbie:

This letter is in response to the call for public comment on the noxious weed EIS for the Bonners Ferry Ranger District. As the Boundary County Weed Control Superintendent I highly recommend that alternative 4 (the integrated management approach) be adopted. I personally know the weed control crew and have the utmost respect and confidence in their ability to apply herbicides and access environmental hazards.

It is important that the entire Forest Service, not only those folks in field, recognize and act upon the serious threat noxious weeds pose to healthy ecosystems. It is vitally important that funding for weed control programs remain in place and that more is done every year.

My only concern with the Draft EIS is that under the Proposed Action the 41 identified sites and 335 acres is misleading. It leads the reader to believe that it is the extent of the weed problem when in fact it is **FAR** greater than that. The severity and rapid spread of ~~Harsh~~ Hawk weed and knapweed needs to be clearly stated and cannot be over emphasized.

Sincerely,

Rich Del Carlo

Rich Del Carlo
Boundary County
Weed Control Superintendent

Response to Boundary County Noxious Weed Control (Rich Del Carlo) letter received August 14, 1995.

1. The Purpose and Need for Action section of Chapter 1 has been changed in the Final EIS to amplify the extent of weed populations on the Bonners Ferry Ranger District.

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District. Your alternative preference is included in the summary of comments on alternatives in the Final EIS. Your comments will be considered in the alternative selection process.

USDA-FOREST SERVICE

RECORD OF PHONE CALL OR VISIT

File Designation 1950 (Weed EIS) Date 7-15-95 Time approx 1:00 PM

Subject Comments to Weed EIS

TO Files

Visited By

Called By Terry Bichnell

Call To

Called at ~~around~~ 1:00 PM to discuss personnel matter. Conversation shifted to the DEIS on weeds. Terry said he had read the document. Informed me that he was not in favor of use of chemicals, especially in the forest. Felt that chemicals were dangerous and the only party benefitting from their use was the chemical companies. He favored treatment without chemicals.

Terry indicated he would be preparing written response.

Robert David
SIGNATURE

ID Leader
TITLE

FS-R1-04-6220-01 (1/82)

Response to Terry Bicknell phone call received July 15, 1995.

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District. Your alternative preferences are included in the summary of comments on alternatives in the Final EIS. Your comments will be considered in the alternative selection process.

Bob K. RK
Deb. [illegible]
(Klaud
EIS
file
last)

AUGUST 4, 1995
BOX 48
NAPLES, ID 83847

DEBBIE HENDERSON-NORTON
DISTRICT RANGER
BONNERS FERRY, IDAHO

DEAR DEBBIE;

WE WOULD LIKE TO GIVE OUR FULL SUPPORT FOR THE NOXIOUS WEED PROGRAM PROPOSED.

NOXIOUS WEED CONTROL IS VERY IMPORTANT TO THE HEALTH OF THE FOREST AS WELL AS PRIVATE PROPERTY.

WE THINK ALTERNATIVE #4 WOULD GIVE THE BEST CONTROL AND BE MOST COST EFFECTIVE.

SINCERELY,

Don N

DON NYSTROM
BOUNDARY COUNTY TIMBER
AND WOOD PRODUCTS
COMMITTEE

Response to Boundary County Timber and Wood Products Committee (Don Nystrom) letter received August 7, 1995.

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District. Your alternative preference is included in the summary of comments on alternatives in the Final EIS. Your comments will be considered in the alternative selection process.

Boundary Soil Conservation District
P.O. Box 23 - Bonners Ferry, Idaho 83805 - Phone: 267-3340

August 10, 1995

Bob Klarich
Bonners Ferry Ranger District
Idaho Panhandle National Forests
Route 4 Box 4860
Bonners Ferry, ID 83805

Dear Bob:

The Draft Environmental Impact Statement for Noxious Weeds Management Projects, Idaho Panhandle National Forests, was recently reviewed by members of the Boundary Soil Conservation District and the Natural Resources Conservation Service and discussed at our last meeting. We would like to commend you for your efforts and fully endorse your noxious weed management proposals as outlined in the draft EIS.

Our group was particularly impressed with the comprehensiveness with which you have investigated the problem and developed alternative management solutions for noxious weeds on forest lands. As you know, the Boundary Soil Conservation District and the NRCS are very concerned with weed control in the local area. We find it refreshing and encouraging that you acknowledge that the problem is not only with private land but that there is a responsibility and need for public land managers to address the issue.

Bob, we wish you luck in your endeavors to manage noxious weeds on forest lands and please let us know if we can assist you in any way. We look forward to hearing of the progress and results of your efforts as your management plan may well become the model to which other public land agencies turn.

Sincerely,

Leonard L Kucera Sr.

Leonard Kucera, Sr.
Chairman

CONSERVATION · DEVELOPMENT · SELF-GOVERNMENT

Response to Boundary County Soil Conservation District (Leonard Kucera, Sr.) letter received August 15, 1995

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District. Your alternative preference is included in the summary of comments on alternatives in the Final EIS. Your comments will be considered in the alternative selection process.

And thank you for your offer of assistance.

B00 K

IDAHO FISH & GAME

PANHANDLE REGION
2750 Kathleen Avenue
Coeur d'Alene, Idaho
83814

Phone (208) 769-1414 • Fax (208) 769-1418

Philip E. Batt / Governor
Jerry M. Conley / Director

August 11, 1995

Ms. Debbie Henderson-Norton
U.S. Forest Service
Route 4, Box 4860
Bonners Ferry, ID 83805

Dear Debbie:

RE: NOXIOUS WEED MANAGEMENT PROJECT DEIS

Thanks for the opportunity to comment on the Draft EIS for noxious weed management on the Bonners Ferry District. In general, we support selection of Alternative 4 because we believe it offers the greatest probability of success of all of the action alternatives, and because we believe the spread of noxious weeds poses a serious threat to biodiversity on the Bonners Ferry District.

The Biological Evaluations in Appendix E generally provide well researched and substantiated reasons for determining that no effect will likely occur to fish and wildlife. Provided chemicals, and particularly those which are highly toxic and persist for long periods of time, are carefully applied, we agree impacts to fish and wildlife should be minimal and outweighed by the benefits of noxious weed control. Based on the worst case scenarios explored in the Fisheries BE's, it is unlikely enough herbicide would enter into creeks to affect fish or aquatic invertebrate populations. Thus, the greatest risk of negatively impacting fish or wildlife is from untrained applicators or accidental spills. As we're sure you are aware, using well trained, conscientious applicators is a must, and safety procedures to prevent spills in waterways are important.

It may be worth noting that 28 of 41 (68%) of the sites proposed for treatment are roads. While not necessarily an applicable comment to this DEIS, it does point out another problem with, and cost of, roads on the National Forest. Preventing the spread of noxious weeds is another justification for minimizing new road construction and maximizing opportunities for road obliteration.

We commend the District for tackling the noxious weed problem and hope it becomes a successful program.

Sincerely,

Dave

David W. Ortmann
Regional Supervisor

DWO:CEC:kh

C: US Fish and Wildlife Service, Spokane
Inland Empire Public Lands Council
Cal Groen, IDFG, Boise

Keeping Idaho's Wildlife Heritage
An Equal Opportunity Employer

Response to Idaho Fish and Game (David Ortmann) letter received August 14, 1995.

Thank you for your interest in noxious weed management on the Bonners Ferry Ranger District. Your alternative preference is included in the summary of comments on alternatives in the Final EIS. Your comments will be considered in the alternative selection process.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Reply To
Attn Of: WD-126

August 15, 1995

Debbie Henderson-Norton, District Ranger
Bonners Ferry Ranger District, Idaho
Panhandle National Forests, Route 4, Box 4860
Bonners Ferry, ID 83805 (208-267-5561)

Re: Noxious Weed Management Projects
Draft Environmental Impact Statement (DEIS)

Dear Ms Henderson-Norton:

The Environmental Protection Agency (EPA) has reviewed the DEIS for the Bonners Ferry Noxious Weed Management Projects. Our review was conducted pursuant to the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Our comments are offered to assist in the preparation of the final EIS.

We are rating this DEIS an EC-2 (Environmental Concerns-Insufficient Information). A summary of our comments will be published in the Federal Register. We believe additional information is required to effectively communicate the nature and risks associated with the proposed herbicide treatments and tie them to specific management objectives. We also believe potential impacts on ground and surface water should be assessed more clearly, and more detail provided on herbicide formulations and application methods in the affected management areas. We have no inherent objection to the use of certain herbicides under appropriate, controlled conditions, if more environmentally-benign alternatives have been demonstrated to be either ineffective or significantly not cost-effective in relation to the herbicide application.

One area of concern is that the draft has not related specific management objectives to specific treatments, which may include herbicides. The management objectives of timber production, game and wildlife habitat, and recreation are identified (cattle grazing is reportedly another), but not associated with vegetation management methods. Would it be desirable, for example, to maintain some browse and shade for game animals? Or do herbicide residues and potential water runoff take on more significance in areas designated for recreation? The appropriate method may vary according to desired management objectives. It would also be instructive to provide some damage threshold graphs, showing the level at which vegetation (ie, noxious weeds) becomes unacceptable if management goals are to be met.

Identifying overall management strategies, which would initially include prevention and maintenance before corrective actions, would clarify the process for EIS readers. Are cattle grazing and the roads themselves major contributors to weed development? Could native vegetation have been enhanced alongside roads to inhibit weed growth? Even though this is looking backward, it's relevant to how the public will view future management strategies and perhaps should be mentioned in the document.

The DEIS presents some technical information on each of the proposed herbicides to be used in Alternative 4 regarding plant specificity and persistance. As suggested above, these concerns should to be related to management purpose, application techniques and site-specificity. We have enclosed a planning document from the Forest Service, Pacific Northwest Region, showing the kinds of site-specific considerations which should be assessed (see I-30). Much of the same information is contained in your supplemental document on risk assessment you sent us, but some enumeration of risk assessment principles and planning needs to be placed in the body of the EIS. This would help prepare the outside reader to relate management objectives to environmental concerns.

Since one of the concerns in using herbicides is the persistance of residues, it would be useful to know the proximity of riparian areas, drainage ditches and potential for herbicides entering the surface and groundwater systems. The two maps in Appendix A may have some of that information, but they should be keyed to qualitative descriptions in the text. There is an obvious need for management flexibility, but the EIS should include a description of which chemicals---2,4-D, dicamba, clopyralid and plicloram---will likely be used in each situation and indicate that records will be kept mapping location of specific applications.

The proposed usage should indicate the method of application and type of formulation. Is it sprayed on plants individually, or is that not cost-effective? The method would indicate potential unintended side-effects from non-selectivity on native plant species, as well as possible water contamination.

A matrix (such as that on 2-11) could show some of these non-quantifiable pluses and minuses alongside cost data, thus making the economic choices not appear so one-sided.

We hope these comments will be useful to you as you prepare the final EIS. If you have any questions about our comments, please contact Doug Woodfill at (206) 553-4012.

Sincerely,

Joan Cabreza

Joan Cabreza, Chief
Environmental Review Section

Enclosure

Response to United States Environmental Protection Agency, Region 10 (Joan Cabreza) letter received August 15, 1995.

1. Control of noxious weeds on a given site has relatively little to do with management objectives and much to do with the goals and objectives throughout the ecosystem the site is associated with. The sites where chosen and EIS written to an ecosystem approach to weed management.

Put another way, if a site had weeds and the weeds were to stay on that site, we would not propose treatment. Unfortunately, we know that is not the case. From noxious weed surveys, characteristics of noxious weeds species present, and resources within the ecosystems that make up the Bonners Ferry Ranger District sites were targeted where the risk of spread would have the greatest impact on sensitive areas in ecosystems which have no or very few noxious weeds.

2. The Idaho Panhandle National Forests has operated under a multi-faceted integrated pest management (IPM) approach since the Record of Decision, Weed Pest Management, Idaho Panhandle National Forests, October 1989. The District has been actively surveying, vegetating new and old road sides, promoting public information about noxious weeds, and is about to (along with other Idaho Forests) go to a weed free hay restriction starting January 1, 1996.

The Proposed Action in Chapter 1 in the Final EIS adds information regarding prevention and maintenance not presented in the Draft EIS.

3. Further enumeration of strategy has been added to Chapter 1, Weed Management Philosophy by reference to an appendix F, "Idaho Panhandle N.F. Proposed Integrated Weed Management Program". This was a guiding strategy reference for the 1989 Weed Pest Management, Idaho Panhandle National Forests EIS.

There have been some other changes as well. In Chapter IV under "Human Resources and Human Health", additional information has been added to emphasize to the read that risk assessment has been completed.

4. There is a reference in Chapter II for a table 2-1. The table was inadvertently left out of the draft publication. The Final EIS has table 2-1 which indicates the preferred treatment and distance to ground or surface water for each site.

5. See response to #4.

6. Chapter 1, "Proposed Action" in the Final EIS identifies that chemicals will be applied either from backpack sprayers or truck mounted boomless sprayers that are powered by gasoline engines.

7. Table 2-4, the table that shows cost to implement each alternative, is the last of four tables in Chapter II. The reader is shown other comparisons of the alternatives including environmental impacts which are in qualitative terms in tables 2-1, 2-2, and 2-3.

CHAPTER VI

LIST OF PREPARERS

The following individuals are core members of the inerdisciplinary team (ID Team) for the Noxious Weeds Management Projects EIS:

NAME	AREA OF EXPERTISE	AREA OF CONTRIBUTION
Bob Klarich	Range/Noxious Weed Mgmt.	ID Team Leader, Writer/Editor
Mark Grant	NFMA/NEPA compliance	Watershed Analysis, Editor
Ed Monnig	Environmental Chemistry	Pesticide Impacts on Region 1 Resources and Human Health
John Chatel	Fisheries Biologist North Zone, IPNF	Fisheries Resource Analysis
Diane Amato	Botanist	Vegetative Analysis
Sandy Jacobson	Wildlife Biologist	Wildlife Analysis
Maridel Merritt	NFMA/NEPA compliance	Editor
Jerry Niehoff	Soils Scientist Idaho Panhandle NF	Soils Analysis

REFERENCES

Ames, B.N. 1983. Dietary carcinogens and anticarcinogens. Science 221:1256-1264.

Belcher, J.W. and S.D. Wilson 1989. Leafy spurge and the species composition of a mixed-grass prairie. Journal of Range Management 42(2):172-175.

Campbell, D.L., J.Evans, G.D. Lindsey, and W.E. Dusenberry, 1981. Acceptance by black-tailed deer of foliage treated with herbicides. Research Paper PNW-290. USDA Forest Service. Pacific Northwest Forest Range Experiment Station. Portland, Oregon.

Crouch, E.A.C., R. Wilson, and L. Zeise. 1983. The risk of drinking water, Water Resources Res 19:1359-1375.

Del Carlo, Rich. 1995. Personal communication between Bob Klarich and Rich Del Carlo, Boundary County Weed Supervisor, Bonners Ferry, Idaho.

Dow Chemical Company. 1986. Chemistry, environmental, and toxicology profiles of clopyralid herbicide. Form NO. 137-1846-86. Midland, Michigan.

Dow Chimical Company. Undated. Clopyralid: technical information. MIdland, MIchigan.

Edson, E.F. and D.M. Sanderson, 1965. Toxicity of the Herbicides 2-Methoxy-3, 6-Dichlorobenzoic Acid (Dicamba) and 2-Methoxy-3, 5, 6-trichlorobenzoic Acid (Tricamba). Food Cosmet. Toxicol. 3-299-304.

Lacey, C. 1987. Overview of the state noxious weed management plan. In: Proceedings of the annual conference of the Montana Weed Control Association. Great Falls. January 13-15.

Lacey, J.R., C.B. Marlow, and J.R. Lane, 1989. Influence of spotted knapweed (Centaurea Maculosa) on surface runoff and sediment yield. Weed Technology 3:627-631.

Losensky, J.B. 1987. An evaluation of noxious weeds on the Lolo, Bitterroot and Flathead Forests with recommendations for implementing a weed control program. Lolo National Forest. Missoula, Montana.

Mayer, F.L. and M.R. Ellersieck, 1986. Manual of acute toxicity: interpretation and data base for 410 chemicals and 66 species of freshwater animals. Resource publication 160, U.S. Department of the Interior. Fish and Wildlife Service. Washington, D.C.

Monnig, E. 1988. Human health risk assessment for herbicide applications to control noxious weeds and poisonous plants in the Northern Region. FPM Report 88-9. USDA Forest Service. Missoula, Montana.

Pitcher, S.L. 1987. Letter from Steven L. Pitcher, State of Montana Water Quality Bureau, to Ronald C. Prichard, Supervisor, Beaverhead National Forest, February 6, 1987.

Peschken, D.P. and P. Harris. Host specificity and biology of Urophora cardui (Diptera: Tephritidae). A biocontrol agent for Canada thistle (Cirsium Arvense). Canada Department of Agriculture, Regina, Saskatchewan.

Rees, N. 1992. Personal communication between J.T. Winfield and Norm Rees, Biological Control Specialist. Agriculture Research Station Rangeland Weeds Lab, Montana State Univesity. Bozeman, Montana.

Rice, P.M. 1990. A Risk Assessment Method To Reduce Picloram Contamination of Streams and Groundwater From Weed Spraying Projects. Division of Biological Science, University of Montana, Missoula, Montana.

Rice, P.M., D.J. Bedunah, and C.E. Carlson, 1992. Plant Community Diversity After Herbicide Control of Spotted Knapweed. USDA Forest Service. Intermountain Research Station. Ogden, Utah.

Rules and Regulations, 1992. Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code. Idaho Department of Lands. Boise, Idaho.

Spoon, C.W., H.R. Bowles and A. Kulla, 1983. "Noxious Weeds on the Lolo National Forest. A Situation Analysis Paper." USDA Forest Service, Northern Region.

Thompson, J. 1990. Personal communication between E. Monnig and John Thompson, Wildlife biologist with State of Montana Department of Fish, Wildlife, and Parks, on the effects of herbicide application to control spotted knapweed on the Three-mile Game Range.

Tyser, R.W. and C.H. Key. 1988. Spotted knapweed in natural area fescue grasslands: an ecological assessment. Northwest Science 62(4):151-159.

USDA Forest Service, 1984. Pesticide background statements. Vol. 1, Herbicides. Agriculture Handbook no. 633. Washington, DC:U.S. Government Printing Office.

USDA Forest Service, 1992. Risk Assessment for Herbicide Use in Forest Service Regions 1, 2, 3, 4, and 10 and on Bonneville Power Administration Sites. FS 53-3187-9-30.

U.S. Environmental Protection Agency. 1986. Ecological Risk Assessment. EPA-540/9-85-001. Office of Pesticide Programs. Washington, DC 20460.

U.S. Environmental Protection Agency, 1986. Quality Criteria for Water (The Gold Book) EPA 440/5-86-001. Office of Water Regulations and Standards. Washington, D.C.

Watson, V.J., P.M. Rice and E.C. Monnig, 1989. Environmental fate of picloram used for roadside weed control. Journal of Enviromental Quality 18:198-205.

Willard, E.E., D.J. Bedunah, and C.L. Marcum, 1988. Impacts and potential impacts of spotted knapweed (Centaurea maculosa) on forest and range lands in western Montana. Montana Forest and Conservation Experiment Station. School of Forestry. University of Montana. Missoula, Montana.

Woodward, D.F. 1976. Toxicity of the herbicides dinoseb and picloram to cutthroat (Salmo clarki) and take trout (Salvelinus hamaycush). J. Fish. Res Can. 33:1671-1676.

Woodward, D.F. 1979. Assessing the hazard of picloram to cutthroat trout. J. Range Management 32:230-232.

Yates, W.E., N.B. Akesson, and D.E. Bayer, 1978. Drift of glyphosate sprays applied with aerial and ground equipment. Weed Science 26:597-604.

Zwolfer, H. and P. Harris, 1965. Ceutorhynchus litura (F.) (Col. Curculionidae). A potential onsect for the biological control of thistle, Cirsium Arvense (L) Scop., in Canada. Canada Department of Agriculture. Belleville, Ontario.

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE RECORD OF DECISION (ROD) HAVE BEEN SENT

COPIES OF THE NOXIOUS WEED RECORD OF DECISION AND CHAPTER V HAVE BEEN DISTRIBUTED TO THE FOLLOWING AGENCIES, LIBRARIES, ORGANIZATIONS AND INDIVIDUALS AS OF SPETEMBER, 1995. AN ASTERISK * DENOTES THOSE AGNECIES, LIBRARIES, ORGANIZATIONS, AND INDIVIDUALS TO WHOM A FINAL EIS WAS SENT ALSO. MOST RECEIVING FIANL EIS COPIES COMMENTED ON THE DRAFT EIS.

FEDERAL AGENCIES AND OFFICIALS

USDA/FOREST SERVICE, ENVIRONMENTAL CO-ORDINATOR, WASHINGTON DC
*USDA/FOREST SERVICE, REGIONAL OFFICE-REGION 1, MISSOULA, MT
*USDA/FOREST SERVICE, NATIONAL FORESTS
    IDAHO PANHANDLE NATIONAL FORESTS, COEUR D'ALENE, ID
*USDA/FOREST SERVICE, RANGER DISTRICTS
    IDAHO PANHANDLE: AVERY DISTRICT, AVERY, ID
    IDAHO PANHANDLE: FERNAN DISTRICT, COEUR D'ALENE, ID
    IDAHO PANHANDLE: PRIEST LAKE DISTRICT, PRIEST LAKE, ID
    IDAHO PANHANDLE: SANDPOINT DISTRICT, SANDPOINT, ID
    IDAHO PANHANDLE: ST MARIES DISTRICT, ST MARIES, ID
*USDA/NATIONAL AGRICULTURAL LIBRARY, BELTSVILLE, MD
*DOCUMENTS DEPARTMENT - KW, THE LIBRARIES, COLORADO STATE UNIVERSITY, FORT COLLINS, CO

US ENVIRONMENTAL PROTECTION AGENCY, DIR. FEDERAL ACTIVITIES, WASHINGTON DC
*US ENVIRONMENTAL PROTECTION AGENCY, SEATTLE OFFICE, SEATTLE, WA

USDI/U.S. FISH AND WILDLIFE SERVICE, SPOKANE, WA
*USDI, OFFICE OF ENVIRONMENTAL COMPLIANCE, PORTLAND, OR

FEDERAL CONGRESSIONAL DELEGATION:
    US SENATOR LARRY CRAIG (ID), WASHINGTON DC AND BOISE, ID
    US SENATOR DIRK KEMPTHORNE, CD'A, ID
    US REP HELEN CHENOWETH, BOISE, ID

STATE AND LOCAL AGENCIES AND OFFICIALS

*IDAHO DEPT. OF FISH AND GAME, COEUR D'ALENE, ID
IDAHO DEPT. OF HEALTH & WELFARE, DIVISION OF ENVIRONMENT, COEUR D'ALENE, ID
IDAHO STATE SENATOR TIM TUCKER, PORTHILL, ID
BOUNDARY COUNTY COMMISSIONERS, BONNERS FERRY, ID
*BOUNDARY COUNTY EXTENSION OFFICE, BONNERS FERRY, ID
CITY OF BONNERS FERRY, BONNERS FERRY, IDAHO
*KOOTENAI COUNTY NATURAL RESOURCES PROTECTION, COEUR D'ALENE, ID
BONNER COUNTY WEED CONTROL, SANDPOINT, ID

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE RECORD OF DECISION AND CHAPTER V HAVE BEEN SENT.

INDIAN TRIBAL AGENCIES

KOOTENAI TRIBAL COUNCIL, BONNERS FERRY, ID
YAKIMA INDIAN NATION, TOPPENSIH, WA

UNIVERSITIES AND LIBRARIES

*BOUNDARY COUNTY LIBRARY, BONNERS FERRY, ID

BUSINESSES

CPI, L.P., BONNERS FERRY, ID
KPND, SANDPOINT, ID

ORGANIZATIONS

ALLIANCE FOR THE WILD ROCKIES, MISSOULA, MT
KOOTENAI VALLEY SPORTSMAN ASSOCIATION, BONNERS FERRY, ID
NORTH IDAHO AUDUBON SOCIETY, BONNERS FERRY, ID
INLAND EMPIRE PUBLIC LANDS COUNCIL, SPOKANE, WA
GREYSTONE, ENGLEWOOD, CO
WOODNYMPH WILDERNESS WATCH, MOSCOW, ID
*BOUNDARY COUNTY SOIL CONSERVATION DISTRICT, BONNERS FERRY, ID
*AGRICULTURAL COMMITTEE, BOUNDARY COUNTY, IDAHO

INDIVIDUALS

KAREN WILLIAMS, COEUR D'LENE, ID
FRANCIS BUCHER, BONNERS FERRY, ID
MIKE AND DAN RIPATTI, BONNERS FERRY, ID
DONNA AND ART BRATTKUS, HOPE, ID
*TERRY BICKNELL, MOYIE SPRINGS, ID
INTERMOUNTAIN RESEARCH, SANDPOINT, ID

APPENDIX A

IDAHO PANHANDLE NATIONAL FORESTS

INTEGRATED WEED MANAGEMENT

Priority I:

Potential New Invaders: Emphasis on education, awareness and prevention of noxious and undesirable weed species that do not yet occur on the National Forest. This will be accomplished by continuing to participate and further develop programs with State and County Agencies informing the public of the various noxious and undesirable weeds that are invading the State and means of helping prevent or control these plants.

A. People working to manage noxious and undesirable weeds need the knowledge and ability to recognize when a new plant is present and what to do about it when one is found or thought to exist. To accomplish this the Forest will expand the present program for in-service training and involvement to reach more of those working on the District (including volunteers and other cooperators) in identification, monitoring, and treatment of new infestations as well as those that are established. The Forest will also expand work with the local State and County agencies in education and awareness programs for the public and land users to recognize Priority I noxious weeds.

B. Develop a monitoring and survey program to maintain surveillance of the Forest for new invaders, spread of established invaders, outbreaks and other related information.

C. The Forest will develop a noxious weed (undesirable plant) field guide for the IPNF with sufficient colored pictures and descriptions so it can be carried in the field as an aid in identifying these plants. Include instructions on collection and submitting plants for identification and techniques to be used in recording infestations. This work will be accomplished in cooperation with State and County Agencies and the University of Idaho.

   A form and instructions for submitting specimens to the U. of I. for identification are included in Appendix J.

D. The IPNF will, at least, on an annual basis, share information on their respective noxious weed treatment programs and established priorities with State and County Agencies and County Weed Control Associations and other interested groups. The IPNF will continue support for the 5 County Weed Association in northern Idaho.

E. Once a Priority I weed is identified as having invaded an area, it will be placed in Priority II and appropriate action taken, as described in Priority II.

Priority II:

Eradication of New Invaders:

The highest priority for treatment will be given to new invading noxious weeds. A key factor in treating Priority II weeds is to prevent conditio that allow them to become established. Eradication is the goal for new invaders. Each District will develop their own list of new invaders. Components of this treatment priority include:

A. New invaders are the highest priority for funding of control effor

B. The objective for new invaders is immediate control and eventual eradication while the infestation is small and before it has a chance to spread. Take appropriate isolation and eradication measures as soon as a new invader is officially identified. Report location o the infestation to the University of Idaho who maintains a State wid inventory.

C. There are drainages, road systems and areas on the IPNF where only a few or a small area of noxious weed infestation exists (breakout areas). This includes several new weed infestations on the forest where the soil was not disturbed by human activity. Spotted knapwe leafy spurge, rush skeletonweed, common St. John's-wort, etc. are ve aggressive plants and compete successfully with native vegetation. example is the new infestation of rush skeletonweed on the meadows along the upper Coeur d' Alene river, section 20, T.54N., R.2E., Boi Merdian. This infestation is 100 yards from the road and no othe development is located near the site. Elimination of the few pla in these areas followed by annual monitoring and follow-up treatmen as needed will keep these areas free of noxious weeds. The treatme will include revegetation to reduce opportunity for re-invasion of noxious weeds.

D. Coordinate surveys with adjacent landowners and other agencies to maximize efforts to identify all infestations.

E. Where feasible, identify and treat the cause(s) of the noxious wee infestations to reduce the possibility of re-entry. This may inc the following:

   1. Means of transport (vehicle, animal, bird, etc.).

   2. Existing vegetation. Identify the vegetation growing on the si of the infestation. Include an estimate of crown density by species.

   3. Identify soil and land conditions. This includes recent disturbances such as road construction, road maintenance, logging, catastrophes such as fire, landslide, etc..

   4. If available, identify closest seed source and other pertine information that may be available such as distance from the Forest, property owner, travel route, etc..

Priority III:

<u>Established Infestations</u>:

Weed species in this priority have become well established and eradication is not economically or environmentally feasible within the boundaries of the IPNF. Generally the treatment for these invaders will be by biological control methods. Exceptions may be around campground, administrative sites, seed orchards and similar areas where mechanical mowing may be in order or chemical treatment followed by revegetation with desirable plants to reduce opportunity for re-invasion by noxious weeds. Seeding of desirable plants and fertilization may be a control in may areas that are now a problem.

This treatment priority includes the following:

A. Emphasis will be on containment and preventing further spread.

B. Special consideration will be given to "breakouts" from established infestation and along routes of spread, or adjacent to private lands. Acceptable, but immediate and effective control measures will be taken in such areas.

C. Any approved control measure may be used on established infestations, however, the decision on which to use will include the "cost/benefit of the alternatives and an evaluation of the likelihood for success.

D. Biological control will be emphasized on established infestations where successful agents are available and an evaluation shows there is reasonable expectation for success. Research Application and Development (R&D) efforts on biological control agents will be concentrated on Priority III species.

E. Management practices will be used in conjunction with control activities. These management practices include, but are not to be limited to:

   1. Promoting the introduction/growth of both native and non-native species of vegetation that will better compete with noxious weeds.

   2. Regulating the movement of and/or the use of livestock.

   3. Regulating the movement of and/or the use of vehicles.

PROPOSED FIVE YEAR IWM PROGRAM OBJECTIVES FOR NEW INVADERS

Summary: New invaders are isolated stands of noxious and other undesirable weeds whose population levels outside a specified area or region are such that all seed production can be prevented each growing season. Based on information gathered during inventory work (1987 & 1988) nine plant species have been identified on the Forest which meet this definition. As yet, none of the nine species occur in large enough population levels that they are causing any significant resource damage. However, all the species are highly aggressive, competitive and difficult to control. If left unchecked all will establish on the Forest, impacting resources. Once established the financial burden of control would be staggering. Hence, control strategies are being implemented now while the numbers of weeds are few and the acreage affected are small. This results in lower costs than if these weeds are allowed to become established.

Project objectives (statements of precise outcomes which can be measured to determine actual accomplishments):

1. The overall objective of this project is immediate containment (100% control) of the nine species listed as new invaders. Ultimately, however the objective is to eradicate all infestations.

2. To take appropriate control measures as soon as a new invader is officially identified to prevent all seed production. This will require follow-up treatment each growing season until the invader is eradicated.

3. To maintain a New Invader list on each Ranger District and maintain an alert program that aids in early detection of new locations.

4. To give highest treatment priority to funding control efforts on new invaders.

5. To hold annual in-service weed education and identification courses and require attendance.

6. To provide weed education and identification clinics and training in cooperation with Counties and other organizations (an example is a Back Country Horsemen Clinic being held in 1989, cooperative work with the North Idaho Weed Association and the Idaho Weed Control Association)

7. To identify and develop strategies for a realistic and systematic survey all lands susceptible to invasion within the boundaries of the IPNF. Surveys will be scheduled to coincide with bloom periods to aid in detection.

8. To identify high risk areas outside the areas of infestation and monitor these at high risk areas on an on-going basis.

9. To identify defendable weed barrier lines for each species concentrating control effort at the perimeters working towards the center of the infestation.

10. To maintain a map record showing locations of all found infestations and keep maps up to date.

11. To identify rehabilitation needs for all sites in the project areas and carry through with rehabilitation.

12. To advise all agencies and organizations with a vested interest in management of the IPNF about these projects and to solicit their support and assistance.

13. To identify and treat the causes of the infestations to reduce the possibility of re-invasion.

14. To coordinate mapping and surveys with State and Local agencies maximize efforts. Enlist support of volunteers, agencies and organizations such as the Idaho Wildlife Federation, Back Country Horsemen, Kootenai Environmental Association and Counties to help with inventory work.

15. To supplement surveys with awareness posters at strategic locations throughout the Forest.

16. To report all new invader locations to the University of Idaho which maintains a statewide inventory.

PROPOSED FIVE YEAR IWM PROGRAM OBJECTIVES FOR POTENTIAL INVADERS

Summary: Potential invaders are noxious and other undesirable weeds as yet unrecorded on the IPNF but the potential for infestation is imminent. Peop who work within the Forest Service as well as users of Forest resources need the knowledge and ability to recognize these exotic species and what to do about them when they are found or thought to exist. Thus, the emphasis in proposed program is education, awareness, and prevention. During the environmental analysis, 28 species were identified as potential invaders -- species are recognized as most likely to invade within the next 5 years. E detection of the Forests future weed problems before they get out of hand i good resource management.

Project objectives (statements of precise outcomes which can be measured to determine actual accomplishments):

1. The overall objective is early detection of noxious and undesirable wee while infestations are such that all seed production can be prevented a prevention of the conditions which allow them to invade the Forest.

2. To continue to participate and further develop programs with individual organizations, other federal agencies and state and county agencies to inform on the means of helping prevent and control these weeds. This includes providing clinics, publications and distribution of brochures provide information on the "most likely" potential invaders.

3. To expand in-service training and involvement to reach more of those working on the Ranger Districts (including volunteers and other cooperators) in identification, proper reporting procedures, monitoring a treatment of potential invaders.

4. To use the University of Idaho form and instructions for submitting specimens (see Appendix J).

5. To begin collecting initial information on potential invaders (i.e. The biology of the weed and of known natural enemies; the biology of the ecosystem surrounding the weed; monitoring techniques; non-toxic manage techniques; and chemical tools ideally used to quickly suppress the in outbreak). First priority will be given to the 10 most likely to invade the next five years.

6. To prioritize the potential invader list for development of surveys. Gi highest priority to those species which occur adjacent to Forest Service lands, species which occur along waterways which run through the Fores which occur along major transportation routes which run through the For

7. To complete initial surveying for the 10 potential invader species thro out the Forest.

8. To establish an annual weed alert and survey program on the Forest.

9. To obtain herbarium specimens of potential invaders and display at all Ranger District Offices.

10. To develop educational materials for distribution to Forest users.

11. To take immediate action when potential invaders are identified to prevent all seed production.

12. To immediately survey, identify, and locate on maps locations of all found potential invaders. Continue annual survey work for the found potential invaders until there is assurance the weeds are eradicated (5 or more years in some cases).

PROPOSED FIVE YEAR PROGRAM OBJECTIVES FOR ESTABLISHED INVADERS

Overview: Established invaders are noxious and undesirable weeds so common on the IPNF that for all practical purposes seed production can not be reasonably prevented. Therefore eradication is not technically feasible. It is feasible however to attempt to contain existing infestations, reduce infested acreage and prevent the establishment of new infestations as a result of land management activities. The primary purpose of this program shall be the protection of uninfested acres of range, forest, recreation and pasture land within the boundaries of the IPNF.

Project objectives (statements of precise outcomes which can be measured to determine actual accomplishments):

1. The main objective is containment, with annual reduction as a long-term goal.

2. To emphasize and prioritize control measures in recreational areas and along routes of spread. Control shall be prioritized beginning with ar[eas] of highest human usage.

3. To locate, map and cause control of isolated infestations of spotted knapweed and St. John's-wort.

4. To coordinate control efforts of northern Idaho counties. Such coordination will stress elimination of duplication and will encourage cooperation and sharing of educational materials.

5. To develop a targeted, Forest-wide education and awareness program foc[using] on users of the Forest.

6. To follow-up initial control efforts with site specific management eff[orts] including seeding, fertilization, and other spot treatment as needed to meet objectives.

7. To determine site-specific injury/action levels using the criteria recommended by the Idaho Noxious Weed Workgroup (Appendix A - Noxious We[ed] Policy Priority III).

8. To use management practices in conjunction with control activities. The[se] management practices include, but are not limited to:

   -- Promoting the introduction/growth of both native and desirable non-native vegetation that will better compete with targeted weeds.

   -- Regulating the movement of and/or use of livestock.

   -- Regulating the movement and/or use of vehicles.

   -- *Use the knapweed road model (Appendix E)or a similar method to pred[ict] the risk of knapweed invasion on all new road construction and timber harvest sites.

-- Use the Losenski knapweed road model (Appendix E) or a similar method to predict the risk of knapweed invasion on all new road construction and timber harvest sites. Use the risk rating to determine mitigation measures necessary to reduce target weed invasion risk.

-- Where practical, retain shade on road surfaces by limiting road-side clearing and harvest cutting.

-- Newly constructed roads should be surveyed and all new knapweed and St. Johns-wort plants pulled or spot sprayed seasonally as a part of road maintenance.

-- Conduct a survey of existing roads. Those segments that are currently free of knapweed and St. John's-wort should be treated as new construction.

-- Evaluate the proposed cutting unit as to the risk of spotted knapweed invasion using the models in Appendix E).

-- Consider requiring "clean" equipment for timber harvest in high risk areas where spotted knapweed and St. John's-wort are not present.

-- Use dozer scarification only when it is the only practical treatment on moderate and high risk areas. This treatment should be carried out with "clean" equipment.

-- Silvicultural prescriptions should be directed at maintaining as much shade as possible on site and limiting the amount of soil disturbance to meet regeneration needs. On high risk areas, consider using single tree or a light shelterwood harvest method.

-- Evaluate the risk of permitting cattle use after harvest on high risk areas (Cattle use occurs on about 3 percent of the Forest).

-- Consider winter logging on high risk areas where seed is present to reduce the threat of seed transfer to uninfested sites in the stand.

-- Consider seeding non-sod forming grasses and forbs to occupy disturbed sites on high risk areas.

9. To expand and further the establishment of host-specific biological agents on St. John's-wort and spotted knapweed and establish specific areas for rapid colonization of new bioagents for future redistribution. Once established these areas will provide sites for training and education purposes.

--Appropriate release sites for colonization of biological control agents will be determined. Release site will be chosen depending on the severity of the weed infestation, present and planned land use and weed control efforts. Releases will be made in densely infested areas. The number of agents released at any site will be that which is deemed optimum for field establishment. Where necessary, cooperation from permittees will be secured to protect the release sites from disturbance from people or livestock.

-- To collect and/or purchase biological agents.

-- To develop a recordkeeping system and regularly monitor release sites ascertain colonization and establishment.

-- To train in-service personnel on identification and life history of bioagents. Training will include procedures for collection and release.

--Purchase and/or develop educational materials which help the public a involved agency personnel understand the major role biological control plays in an integrated weed management program.

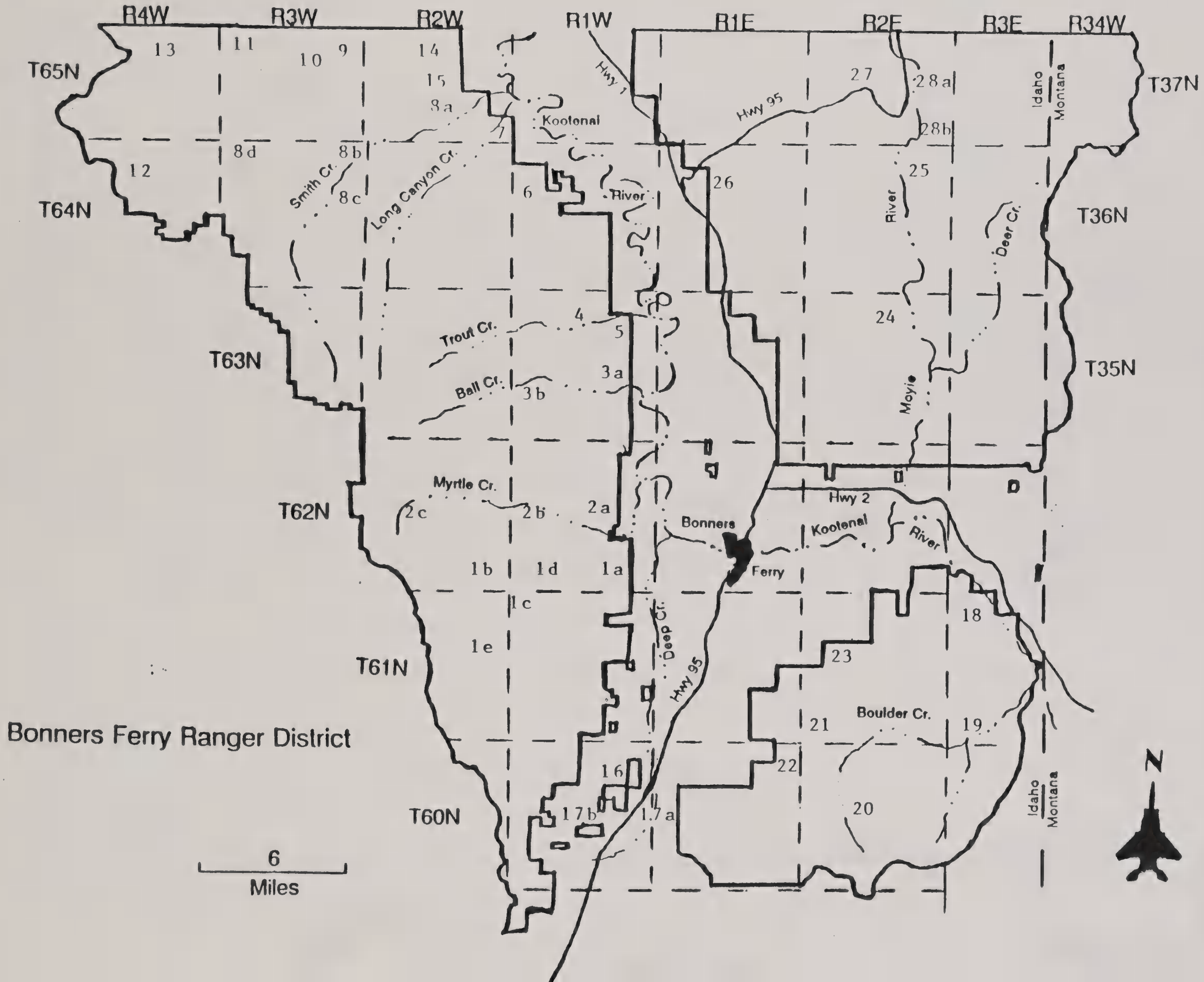
-- To monitor the population development and spread of the colonized agents.

-- If appropriate, quantitative evaluation of the bioagent populations be performed following the guidelines and procedures set by Dr. Joe McCaffery, University of Idaho or a similar survey procedure.

* Losenski's models may need modification to meet the climatic and environmental characteristics found on the IPNF.

	Site No	Site	Man	Bio	2,4-D	Dicamb/Clop	Picl and 2,4-D	Mileage/acres	Weed Species Treated	Proximity to water
1	1a	Snow Cr A Rd 402	~	~	~	P	X	7.5 m/18.2ac	Hawkweed, tansy, knapweed, road row	Mostly greater than 300'
2	1b	Snow Cr B Rd 1007	~	~	~	X	P	2 mi/4.8 ac	Hawkweed; along road row	Greater than 300'
3	1c	Snow Cr C Caribou Pass	~	~	~	~	P	.3 mi/.73 ac	Hawkweed; along road row	Greater than 300 '
4	1d	Snow Cr D Rd 2646A		~	~	P	X	3 mi/7.3 ac	Hawkweed, common tansy; road row	Greater than 300'
5	1e	Snow Cr E d 2667	X	~	~	P	~	.1 mi/.24 ac	Common tansy; small patch near road	Greater than 300'
6	2a	Myrtle Cr A Rd 2411&633	~	~	~	X	P	3 mi/7.3 ac	Knapweed; along road row	Greater than 300'
7	2b	Myrtle Cr B Mid Rd 633	X	~	X	P	X	2.8 mi/6.7 ac	Hawkweed, tansy; along road row	Mostly greater than 300'
8	2c	Mrytle Cr C Upper Rd 633	X	~	~	~	P	.2 mi/.48 ac	Hawkweed; along road row	Mostly greater than 300'
9	3a	Ball Cr A Rd 432	~	~	~	~	P	2.6 mi/6.3 ac	Hawkweed, knapweed; along road row	Greater than 200'
10	3b	Ball Cr B Rds 432 & 2411	~	~	~	P	~	4 mi/9.6 ac	Hawkweed, tansy; along road row	Mostly greater than 200'
11	4	Trout Cr Rd 634	~	~	~	~	P	5.4 mi/13.1ac	Hawkweed, knapweed; along road row	Greater than 300'
12	5	Lower Trout Cr cow allot	~	~	P	P	X	8 ac	Hawkweed; continous in places	Within 100'
13	6	Parker Cr trails 14&221	~	~	~	~	P	.9 ac	Hawkweed, knapweed; along 1st 1.2 m	Greater than 300'
14	7	Long Canyon Cr Trail	~	~	~	P	~	.5 ac	Hawkweed, tansy; along 1st .5 mi	Greater than 300'
15	8a	Smith Cr A Lower Rd 281	~	~	~	~	P	4 mi/9.6 ac	Hawkweed, knapweed; along road row	Greater than 300'
16	8b	Dead Cow, Beaver, Saddle	~	~	~	~	P	13.8 mi/33 ac	Hawkweed; along road row	Mostly greater than 200'
17	8c	Upper Smith Cr Rd	~	~	~	~	P	7 mi/17 ac	Hawkweed; along road row&meadows	Mostly greater than 300'
18	8d	Upper Cow Cr	~	~	~	P	X	6 ac	Hawkweed; in meadows	Mostly greater than 300'
19	9	Saddle/Boundary Roads	~	~	~	~	P	7 mi/17 ac	Hawkweed; along road row	Greater than 200'
20	10	Saddle Cr harvest units	~	~	~	X	P	20 ac	Hawkweed; sporadic thru units	Greater than 100'
21	11	Grass Cr Rd 636	~	~	P	~	P	8.2 mi/19.9 a	Hawkweed; along road row	Mostly greater than 100'
22	12	Grass Cr Gravel Pit	~	~	~	~	P	2 ac	Hawkweed; sporadic	Greater than 300'
23	13	Bog Cr	~	~	~	~	P	1.5 ac	Hawkweed; sporadic	Greater than 200'
24	14	Boundary Cr Rd 2450	~	~	~	~	P	1.6 mi/3.9 ac	Hawkweed; along road row	Greater than 200'
25	15	Italian Rd 282 and 2450	~	~	~	P	X	5 mi/12.1 ac	Hawkweed; along road row	Greater than 300'
26	16	Stampede Skeleton Weed	~	~	~	~	P	12 ac	Skeleton, Toadflax; scattered	Greater than 300'
27	17a	Stampede A BPA Powerline	~	~	~	~	P	1 mi/2.4 ac	Several; along access road	Greater than 300'
28	17b	Stampede B Motorbike tr	~	~	~	~	P	1 mi/2.4 ac	Several; along motorbike trails	Greater than 300'
29	~	~	~	~	~	~	~	~	~	~
30	18	Katka Rds 314/2209/2207	~	~	~	X	P	10.2 mi/24.7	Several; along road row	Mostly greater than 300'
31	19	Boulder Rd 408, 628	~	~	~	~	P	1.2 mi/2.9 ac	Several; road row	Mostly greater than 300'
32	20	Boulder Meadows	X	~	~	P	X	1.5 ac	Hawkweed; sporadic	Greater than 200'
33	21	Black Mountain Rd 274/408	~	~	~	P	X	2.6 mi/6.3 ac	Hawkweed, tansy; along road row	Greater than 300'
34	22	Twentymile Rd 408	~	~	~	P	X	1.0 mi/2.4 ac	Tansy, Hawkweed; along road row	Greater than 300'
35	23	Cabin Cr	~	~	~	~	P	1.5 mi/3.6 ac	Hawkweed, knapweed; along road row	Greater than 200'
36	~	~	~	~	~	~	~	~	~	~
37	24	Meadow Cr roads and CG		~	~	X	P	7 mi/17 ac	Several; along roads and in CG	Greater than 200'
38	25	Sinclair Lake Access Rds	~	~	~	P	~	1.3 mi/3.2 ac	Hawkweed, knapweed; along road row	Greater than 100'
39	26	Brush Lake Access	~	~	~	X	P	2.8 mi/6.8 ac	Hawkweed, tansy; along roads	Greater than 300'
40	27	Robinson Lake CG & roads	~	~	~	P	~	2.2 mi/5.3 ac	Hawkweed, tansy; roads & CG	Mostly greater than 100'
41	28a	Copper Cr A CG Access Rd	~	~	~	P	~	1.4 mi/3.4 ac	S.Knapweed; along access roads	Greater than 200'

	Site No	Site	Man	Bio	2,4-D	Dicamb/Clop	Picl and 2,4-D	Mileage/acres	Weed Species Treated	Proximity to water
42	28b	Copper Creek B Rds 2509	~	P	P	~	P	6 mi/14.5 ac	C.Thistle, S.Knapweed, Hawkweed	Greater than 300'
43		& 2511	~	~	~	~	~	~	along roads and in clearcuts	~
44	~	~	~	~	~	~	~	~	~	~
45	~	~	~	~	~	~	~	~	~	~



Bonners Ferry Ranger District

APPENDIX B

HARVARD UNIVERSITY
SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF HEALTH POLICY AND MANAGEMENT
(617) 732-1090

677 Huntington Avenue
Boston, Massachusetts 02115

February 1, 1990

Dr. Richard E. Stuckey
Director
The National Association
of Wheat Growers Foundation
415 Second Street, N.E.
Suite 300
Washington, DC 20002

Dear Dr. Stuckey:

In response to your request for an independent review of the evidence on 2,4-D and cancer, I have the pleasure of transmitting to you the final report of the workshop held October 17-19, 1989. The report considers both the toxicological (animal) and epidemiological (human) evidence.

The toxicology data by itself provides little reason to expect that 2,4-D causes cancer in people. Experimental studies have shown an excess of brain tumors in male rats at the highest levels of exposure but not in female rats or mice of either gender. Further research is necessary to generate reliable data on the effects of high doses ingested by male rats. If 2,4-D is ultimately shown to be an animal carcinogen, it is unlikely to be a very potent one.

Weighing the epidemiological evidence, the workshop concluded that a cause-and-effect relationship between 2,4-D and cancer is far from being established. The results of two studies conducted by the same research team suggest an association between the occupational use of 2,4-D and non-Hodgkin's lymphoma. However, the workshop participants felt this association needs to be interpreted cautiously, first, because other studies have not shown the same results and second, because some factor other that 2,4-D might be involved. Additional epidemiological studies already underway in the United States, Canada, New Zealand and Sweden will address this question.

Based on all available evidence, the panelists were asked to assess how likely it is that exposure to 2,4-D is capable of causing cancer in people. None of the panelists felt that the evidence was strong enough to conclude that 2,4-D is either a known or probable cause of cancer. Of the 13 panelists, 11 felt it is possible that exposure to 2,4-D can cause cancer in humans, though not all of them felt the possibility was equally likely: one thought the possibility was relatively strong,

leaning toward probable; and five thought the possibility was relatively remote, leaning toward unlikely. A minority of two participants felt it was unlikely that 2,4-D can cause cancer in people. Several members felt that the evidence was barely adequate to support any conclusion. (The panel stressed that it used the terms "probable" and "possible" in their ordinary sense and not as reference to specific carcinogen classification categories used by any regulatory agency.)

As a means of resolving these issues, workshop participants stressed the need for future studies to develop more reliable and precise estimates of 2,4-D exposure and to distinguish more clearly between 2,4-D and other agents in the collection and analysis of data and the reporting of results.

In closing, I would like to recognize the distinguished panel of workshop participants and project staff for their thorough, expert evaluation of the complex body of scientific literature on this widely-used product.

Yours sincerely,

John D. Graham

John D. Graham, Ph.D.
Director
Program on Risk Analysis and Environmental Health

APPENDIX C

APPENDIX C
PROCEDURES FOR MIXING, LOADING, AND DISPOSAL OF PESTICIDES

The following measures will apply to all pesticide applications.

1. All mixing of pesticides will occur at least 100 feet from surface waters or well heads.

2. Dilution water will be added to the spray container prior to addition of the spray concentrate.

3. All hoses used to add dilution water to spray containers will be equipped with a device to prevent back-siphoning.

4. Applicators will mix only those quantities of pesticides that can be reasonably used in a day.

5. During mixing, mixers will wear a hard hat, goggles or face shield, rubber gloves, rubber boots, and protective overalls.

6. All empty containers will be triple rinsed and rinsate disposed of by spraying near the application site at rates that do not exceed those on the spray site.

7. All unused pesticide will be stored in a locked building in accord with pesticide storage regulations contained in Forest Service Handbook 2109.13.

8. All empty and rinsed pesticide containers will be punctured and either burned or disposed of in a sanitary landfill.

APPENDIX D

APPENDIX D
SPILL PLAN

The following equipment will be available with vehicles or pack animals used to transport pesticides and in the immediate vicinity of all spray operations.

1. A shovel
2. A broom (except backcountry operations)
3. 10 pounds of absorbent material or the equivalent in absorbent pillows.
4. A box of large plastic garbage bags.
5. Rubber gloves
6. Safety goggles
7. Protective overalls
8. Rubber boots

The appropriate Material Safety Data Sheets will be reviewed with all personnel involved in the handling of pesticides.

The following material from the U.S. EPA document entitled *Applying Pesticides Correctly: A Guide for Private and Commercial Applicators* will be reviewed with all personnel involved in handling pesticides.

CLEAN UP OF PESTICIDE SPILLS

Minor Spills

Keep people away from spilled chemicals. Rope off the area and flag it to warn people. Do not leave unless someone is there to confine the spill and warn of the danger. If the pesticide was spilled on anyone, wash it off immediately.

Confine the spill. If it starts to spread, dike it up with sand or soil. Use absorbent material such as soil, sawdust, or an absorbent clay to soak up the spill. Shovel all contaminated material into a leakproof container for disposal. Dispose of it as you would excess pesticides. Do not hose down the area, because this spreads the chemical. Always work carefully and do not hurry.

Do not let anyone enter the area until the spill is completely cleaned up.

Major Spills

The cleanup of a major spill may be too difficult for you to handle, or you may not be sure of what to do. In either case, keep people away, give first aid if needed, and confine the spill. Then call Chemtrec, the local fire department, and State pesticide authorities for help.

Chemtrec stands for Chemical Transportation Emergency Center, a public service of the Manufacturing Chemicals Association. Its offices are located in Washington, D.C. Chemtrec provides immediate advice for those at the scene of emergencies.

Chemtrec operates 24 hours a day, seven days a week, to receive calls for emergency assistance. For help in chemical emergencies involving spills, leaks, fire, or explosions, call toll-free 800-424-9300 day or night. This number is for **emergencies** only.

If a major pesticide spill occurs on a highway, have someone call the highway patrol or the sheriff for help. (Carry these phone numbers with you.) Do not leave until responsible help arrives.

In addition the section from the *Northern Region Emergency and Disaster Plan* entitled "Hazardous Materials Releases and Oil Spills" will be reviewed with all appropriate personnel (see following pages). Notification and reporting requirements as outlined in this section will be followed in the unlikely event of a serious spill.

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS

(Excerpted from the *Northern Region Emergency and Disaster Plan*)

AUTHORITY: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and Superfund Amendments and Reauthorization Act of 1986 (SARA). Other statutes that may apply include Resource Conservation and Recovery Act (RCRA); Hazardous and Solid Waste Amendments (HSWA); Toxic Substances Control Act (TSCA); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Clean Water Act (CWA); and Clean Air Act (CAA).

DEFINITION: A hazardous materials emergency or oil spill is defined as any release or threat of release of a hazardous substance or petroleum product that presents an imminent and substantial risk of injury to health or the environment.

A release is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

Releases that do not constitute an immediate threat, occur entirely within the work place, are federally permitted, or are a routine pesticide application, are not considered to be an emergency and are not covered by this direction.

RESPONSIBILITY: The first person who knows of a release and is capable of appreciating the significance of that release has the responsibility to report the release.

Only emergency release response and reporting is covered by this direction. Non-emergency reporting will be accomplished by appropriate RO staff specialists who should be notified directly of all non-emergency releases.

An emergency release of a hazardous substance or petroleum product may be from a Forest Service operation or facility; from an operation on National Forest land by a permit holder, contractor, or other third party; or from a transportation related vehicle, boat, pipeline, aircraft, etc., crossing over, on, or under Forest lands. Response and/or reporting by Forest Service employees will differ in each situation:

1. If the release is from a Forest Service facility or operation, the Forest Service and its employee(s) is clearly the "person in charge," and is fully responsible for all reporting. Immediate response action is limited to that outlined in emergency plans and only to the extent that personal safety is not threatened.

2. If the release is from a third party operation, the Forest Service will only respond and/or report the emergency if the third party fails to take appropriate action.

3. If the release is from a transportation related incident, the Forest Service will only respond and/or report the emergency if the driver or other responsible party is unable or fails to take appropriate action.

RESPONSE ACTION GUIDE: THE PRIMARY RESPONSIBILITY OF ANY FOREST EMPLOYEE(S) ENCOUNTERING A HAZARDOUS MATERIALS EMERGENCY OR OIL SPILL IS COMPLETE AND ACCURATE REPORTING TO APPROPRIATE AUTHORITIES IN A TIMELY MANNER.

Forest Service employee(s) will not assume an incident command role for any hazardous materials emergency or oil spill, but may provide support services as directed by an authorized Federal On-Scene Coordinator (OSC) or other State or local authorized authority.

Within the limits of personal safety, common sense, and recognition of the dangers associated with any hazardous materials emergency or oil spill, Forest Service employee(s) may provide necessary and immediate response actions until an authorized OSC or other authority can take charge. These actions may include:

- Public warning and crowd control.
- Retrieval of appropriate information for reporting purposes.

Additionally, and only after verification of the type of hazardous material involved and its associated hazards, a Forest Service employee(s) may also take actions including:

- Rescue of persons in imminent danger.
- Limited action to mitigate the consequences of the emergency.

Under no condition shall a Forest Service employee(s):

- Place themselves or others in imminent danger.
- Perform or direct actions that will incur liability for the Forest Service.

IF THERE IS ANY QUESTION THAT THE EMERGENCY MAY CONSTITUTE A THREAT TO PERSONAL SAFETY, LIMIT YOUR RESPONSE TO PUBLIC WARNING AND REPORTING OF THE INCIDENT.

PRECAUTIONS: When approaching the scene of an accident involving any cargo, or other known or suspected hazardous materials emergency including oil spills:

Approach incident from an upwind direction, if possible.

Move and keep people away from the incident scene.

Do not walk into or touch any spilled material.

Avoid inhaling fumes, smoke, and vapors even if no hazardous materials are involved.

Do not assume that gases or vapors are harmless because of lack of smell.

Do not smoke, and remove all ignition sources.

ORGANIZATIONS FOR EMERGENCY AND TECHNICAL ASSISTANCE:

CHEMTREC - Chemical Transportation Emergency Center - 800-424-9300
(24 hour) (For assistance in any transportation emergency involving chemicals.)

Rocky Mountain Poison Control Center - 800-525-5042 (24 hour)
303-629-1123 (24 hour)

National Agricultural Chemicals Association - 202-296-1585
(For pesticide technical assistance and information referral.)

Bureau of Explosives - 202-293-4048
(For explosives technical assistance.)

Centers for Disease Control - 404-633-5313
(For technical assistance regarding etiologic agents.)

EPA Region 8 (MT, ND, SD)
Emergency Response Branch - 303-293-1723; FTS 564-1723

EPA Region 10 (Idaho)
Superfund Removal and Invest Section - 206-442-1196; FTS 399-1196

Montana Department of Health and Environmental Sciences (24 Hour) 406-444-6911
Water Quality Bureau - 406-444-2406
Solid Waste Management Bureau - 406-444-2821

North Dakota State Health Department
Environmental Engineering - 701-224-2348
Hazardous Waste Division - 701-224-2366
Radiological Hazardous Substances - 701-224-2348

South Dakota Division of Environmental Quality
Office of Water Quality - 605-773-3296
Office of Solid Waste Management - 605-773-5047

Idaho Department of Health and Welfare
Water Quality Bureau - 208-334-5867
Solid Waste Bureau - 208-334-5879

INDIVIDUAL

Actions	Contacts
Do not expose yourself or others to any unknown material. a. Do not attempt rescue or mitigation until material has been identified and hazards and precautions noted. b. Warn others and keep people away. c. Approach only from upwind. d. Do not walk in or touch material. e. Avoid inhaling fumes and vapors. f. Do not smoke, and remove ignition sources.	District Dispatcher or Ranger
Report the incident. Complete "Reporting Action Guide" within reasonable limits of exposure and timeliness, and report information to District/ Forest Dispatcher.	
If there is any question that incident is a threat to personal safety, limit response to public warnings and reporting.	

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- CONTACT LIST AND IMMEDIATE ACTION GUIDE

DISTRICT

Actions	Contacts
Insure reporting individual is aware of hazards associated with incident.	Forest Dispatcher
Obtain as much information as possible, complete a copy of the "Reporting Action Guide," and relay all information to Forest Dispatcher.	
For fixed facilities, verify if possible, whether or not an emergency guide, Spill Prevention Control and Countermeasure Plan, or similar response plan is available for the specific emergency. If so, implement the response actions as indicated.	
Dispatch additional help, communications systems, etc., to incident scene if incident is on National Forest land or is caused by Forest Service activity or facility. Otherwise support as requested by official in charge.	
If there is any question that incident is a threat to personal safety, limit response to public warning and reporting.	

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- CONTACT LIST AND IMMEDIATE ACTION GUIDE

FOREST

Actions	Contacts
Immediately contact the Forest Hazardous Materials Incident Coordinator who will take the following actions: a. Determine if incident is true emergency. b. Determine who is responsible party for incident, and whether appropriate actions and reporting have been accomplished. c. From available information, determine hazards and precautions, if possible, and relay further instructions to reporting individual through the District. d. Initiate appropriate local reporting actions, and coordinate responses with District. e. Arrange Forest support for on-scene coordinator and/or local emergency response officials as requested.	Forest Hazardous Materials Incident Coordinator who will determine extent of emergency. If incident is determined reportable, contact: a. National Response Center (X9). b. EPA Hazmat emergency response (X3). c. Regional Incident Dispatcher (1). d. County sheriff and/or county disaster and emergency services coordinator. e. State Emergency and Disaster organizations (X12, X15, X17, X21) f. North Dakota State Fire Marshal for oil spills in North Dakota only (X19). g. Internal Forest contacts.
Make appropriate local emergency contacts as directed by Forest Hazardous Materials Incident Coordinator.	
Relay information from Forest Hazardous Materials Incident Coordinator back to District and up to Regional Office as appropriate.	

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- **CONTACT LIST AND IMMEDIATE ACTION GUIDE**

REGIONAL INCIDENT DISPATCHER

Actions	Contacts
Immediately contact the Regional Hazardous Materials Incident Coordinator who will take the following actions: a. Personally work with Forest Hazardous Materials Incident Coordinator to determine extent of the emergency. If incident is reportable, implement the following actions: (1) By Data General (DG) mailing list notify: Regional Forester, Deputy Regional Foresters, Staff Directors, Attorney-In-Charge (OGC). (2) Contact other RO specialists, other Agency personnel, etc., as necessary to determine scope of problem and appropriate actions. RO specialist contacts include: (a) Regional Watershed Coordinator (if incident involves streams, lakes, rivers, etc.) (2) (b) Regional Reclamation Officer (if incident involves mining) (12) (c) Regional Safety and Health Program Manager (6) (d) Regional Cooperative Forestry and Pest Management (if pesticide related) (13) (3) Arrange Regional support for on-scene coordinator and/or local emergency response officials as requested. (4) Arrange a Regional investigation/followup team if determined to be necessary. (5) Keep Regional Forester, Staff Directors, and OGC advised of situation via routine DG updates.	Regional Hazardous Materials Incident Coordinator (11)
	Regional Emergency Coordinator (4)
	If incident is determined to be reportable, verify that National Response Center and appropriate Federal, State, and local contacts have been made.
	WO Engineering (Environmental Health) (W3)
	WO Personnel Management (Safety and Health) (W4)

HAZARDOUS MATERIALS RELEASES AND OIL SPILLS -- **CHECKLIST**

HAZARDOUS MATERIALS AND OIL SPILLS REPORTING ACTION GUIDE

Although reporting requirements vary depending on the type of incident, the responsibility of the employee(s) in the field is limited to collecting appropriate information and relaying it to the proper level of the organization in a timely manner. Following is a list of the information that should be collected, if possible; however, **it is more important to maintain personal safety and report in a timely manner than to collect all information.**

1. Date:

Time of release:
Time discovered:
Time reported:
Duration of release:

2. Location:(Include State, county, route, milepost, etc.)

3. Chemical name:

    Chemical identification number:
    Other chemical data:

NOTE: For transportation related incidents, this information may be available from the driver, placards on the vehicle, and/or shipping papers.

4. Known health risks:

5. Appropriate precautions if known:

6. Source and cause of release:

7. Estimate of quantity released:______________________________gallons
    Quantity reaching water:____________________________________gallons
    Name of affected watercourse:

8. Number and type of injuries:

9. Potential future threat to health or environment:

10. Your name:
    Phone number for duration of emergency:
    Permanent phone number: FTS____________ Commercial____________________

For transportation related incidents, also report:

11. Name and address of carrier:

12. Railcar or truck number:

If there is any doubt whether an incident is a true emergency, or whether reportable quantities of hazardous materials or petroleum products are involved, or whether a responsible party has already reported the incident, **always report the incident.**

APPENDIX E

United States Department of Agriculture | Forest Service | Bonners Ferry Ranger District (208)267-5561 | Route 4, Box 4860 Bonners Ferry, ID 83805-9764 FAX (208)267-7423

Reply to: 2670

Date: 6/7/95

Subject: Sensitive Fish Biological Evaluation for Noxious Weed EIS

To: District Ranger, Bonners Ferry

1. **Introduction**

U.S.D.A. Forest Service policy (FSM 2672.4) requires a Biological Evaluation (B.E.) to be completed to review programs or activities in sufficient detail to determine how a project or proposed activity may affect any threatened, endangered, proposed or sensitive species. The B.E. process is intended to analyze and document activities necessary to ensure proposed management will not jeopardize the continued existence or cause adverse modification of habitat.

The purpose of this B.E. is to evaluate the potential effects of the proposed Noxious Weed EIS on threatened, endangered, and sensitive fish species, and determine whether any such species and habitat are likely to be adversely affected by the proposed action.

2. **Proposed Action**

The proposed action will use a combination of manual, cultural, biological, and chemical treatments to control noxious weeds. Each treatment is described below.

Manual Control:

Manual control methods range from hand pulling and grubbing with hand tools to clipping or cutting the plants with scythes or other cutters. If sufficient root mass is removed, the individual plant can be destroyed. Cutting the plants will reduce reproduction of perennial plants and weaken its competitive advantage by depleting carbohydrate reserves in the root systems.

Cultural Control:

Cultural control generally involves manipulating a site to increase the competitive advantage of desirable species and decrease the competitive advantage of undesirable species. Manipulations could involve transplanting native plants to shade out weedy species or covering weed-seed contaminated soil with a layer of uncontaminated soil. Seeding grass species and applying fertilizer on site where ground cover is sparse could help to culturally control weeds.

Biological Control:

Cultural and manual treatments would be supplemented with the release of biological agents such as parasites, predators and pathogens that have shown some promise in reducing weed infestations. At the present time relatively few biological control agents are available that are effective against the weed species of concern here.

Biological control is the use of biotic agents to attack undesirable plant species. Populations of native species are generally limited in part by herbivorous and pathogenic organisms as well as by competition for nutrients and moisture. Non-native vegetation has had a dramatic impact in many parts of the West because it has been introduced without biological control agents present in its place of origin. The introduction of these control agents is viewed by most experts as the best long-term solution to the noxious weed problem.

Currently, two biocontrol agents, Urophora affinis and Urophora quadrifasciatus, are present in some knapweed infestations on the district. In sufficient concentrations these seedhead flies can reduce seed production by 50 to 90 percent. However, knapweed is such a prolific seed producer that these organisms have had no effect on the density of the infestations and little effect on its rate of spread.

Several biological agents are currently being introduced into the United States for the control of Canada thistle. Ceutorhynchus litura is a stem mining weevil which attacks the young Canada thistle plants in early spring. The stem mining larvae internally attack the elongating stem in early summer. As the larvae develop they begin to create numerous exit holes near the root crown leaving the plant succeptible to a variety of plant pathogens. Under ideal circumstances (soil, size of infestation, climate etc.) population densities may be reduced up to 90 percent depending on the number of weevils released at the infestation (Rees, 1992).

Urophora cardui is a stem and shoot gall fly which attacks Canada thistle. Adults deposit their eggs on the axil of the stem in early summer. As the larvae develop they burrow into the stem creating a walnut size bowl or gall. The gall formation diverts the normal nutrient translocation away from the metobolic and reproductive systems of the plant. As a result flowers develop abnormally, and seed production is reduced.

Chrysolina quadrigemina is a defoliating beetle which attacks St. Johnswort or goatweed. This defoliating beetle has successfully reduced the density of this weed in locations where fall temperatures are mild and the rainfall is abundant. There have been introductions of this beetle annually since 1990. The beetle is thriving and is found at several locations on the district. There is evidence of St. Johnswort populations suffering the effects of defoliation by this beetle.

Climatic and habitat conditions are expected to play a major role in the success of biological control agents. The adaption of these biocontrol organisms to the habitats currently infested by Canada thistle remains an unknown.

It should be noted that biological control agents will not completely eradicate a noxious weed infestation. Rather, a biological control strategy would allow the weed species to spread, though at lower density, through all suitable habitats in the forest.

Chemical Control

Four herbicides, 2,4-D, dicamba, clopyralid, and picloram, were considered for application on various sites. 2,4-D is herbicide with very little persistence in the environment. The herbicide has low toxicity to aquatic species and several formulations are approved for use in water and near water. As noted above, aquatic applications are not proposed in this program. At application rates of 1 to 1.5 pounds per acre 2,4-D exhibits good control of knapweed with repeat applications and moderate control of goatweed, houndstongue, sulfur cinquefoil, and Canada thistle.

Dicamba is a broadleaf herbicide that is readily absorbed by leaves and roots and is concentrated in the metabolically active parts of the plants. Dicamba is effective against a similar range of weed species as 2,4-D at similar application rates. However, dicamba is somewhat more persistent than the 2,4-D herbicide and thus provides somewhat longer control of susceptible species.

Clopyralid is relatively new herbicide that is very selective and is toxic to some members of only three plant families: the composites, the legumes, and the buckwheats. At application rates of one-quarter to one-half pound per acre, clopyralid is very effective against knapweed, the hawkweeds, and Canada thistle. However, it does not control any of the other weed species of concern. Clopyralid is more persistent than 2,4-D and dicamba, but less persistent than picloram.

The selective nature of clopyralid make it an attractive alternative on sites with non-target species that are sensitive to the other herbicides. Clopyralid has comparable soil-mobility characteristics as picloram, so the possibility of ground-water impacts must be addressed.

Picloram controls a variety of broad-leaved weed species, including all the weeds species of concern here. Picloram is generally applied at rates of one-quarter to one-half pound per acre. However, picloram's combination of mobility and persistence have generated concern over possible ground-water contamination. Possible environmental impacts are compared between this method and the other chemical and non-chemical control methods.

Control with a combination of chemical and non-chemical control

Site conditions such as vegetation types, soil types, and infestation levels vary significantly on some sites under consideration in this EIS. Therefore a combination of chemical and non-chemical methods may be selected for some sites. The selection of a herbicide alternative for a site would not prevent the application of manual methods either concurrently or as a follow-up treatments on remnant weeds on a site.

Control with mixtures of the herbicide Picloram and 2,4-D

Some control specialists treat several noxious weed species with mixtures of 2,4-D and picloram. Use of a mixture is done to reduce the quantity of the picloram to half of what is normally applied and thus reducing the amount of effects on non-target species.

Herbicide prescriptions would be consistent with or more restrictive than product label requirements. If a herbicide is used in the annual floodplain, the Forest Service would only apply a herbicide formulation approved by the U.S. Environmental Protection Agency for direct applications to water.

3. **Action/Evaluation Area**

Implementation is proposed on 41 sites on the Bonners Ferry Ranger District (Boundary County). The size of these sites range from .48 acres in Myrtle Creek to 33 acres in Saddle Creek. Over 83% of the 41 sites identified with infestations are located along roads and trails. For more specific location information refer to the Noxious Weed EIS.

4. **Listed Species**

U.S.D.A. Forest Service Region 1 has identified three sensitive species that may be present in the analysis areas (U.S.D.A. 1989 and 1991). These species are also considered Species of Special Concern by the State of Idaho. These species are:

Westslope Cutthroat Trout, Oncorhynchus clarki lewisi
Bull Char, Salvelinus confluentus
Redband Trout, Oncorhynchus mykiss

The bull char is now considered a Category C1 species under the Endangered Species Act (1973). The U.S. Fish and Wildlife Service decided on June 8, 1994 that the bull char is warranted but precluded from listing. On February 6, 1995 the USFWS changed the bull char status to warranted. This means significant threats exist to the continued existence of the species and the USFWS is in the process of drafting regulations. Redband and are listed as a C2 species under the Endangered Species Act (1973).

Westslope cutthroat are listed as a Category species, as of November 15, 1994, under the Endangered Species Act, (1973). This means that the U.S. Fish and Wildlife Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on the biological vulnerability and threats are not currently available to support the proposed rules.

The United States Fish and Wildlife Service has listed the Kootenai River population of White Sturgeon as endangered under the Endangered Species Act (Federal Register 59:171:45989-46001).

White Sturgeon, Acipenser transmontanus

5. **Prefield and Field Review**

A prefield review was conducted using literature accounts, District and Idaho Fish and Game (IDFG) sightings, and the evaluation of the location and scope of the project. No field review was completed.

6. Analysis of Effects

Status of Sensitive, Threaten, and Endangered Species in Analysis Area

__Bull Trout__ (Salvelinus confluentus)

Bull Char are found in cold water streams, rivers, and lakes (U.S.D.A. 1989). Bull char spawn in late summer through fall (August to November), often in areas of ground water infiltration. Fry hatch at the end of January and emerge in early spring (April). Juveniles remain near the stream bottom or in low velocity habitat (pools and pocketwater) for the first two years of their life. Unembedded substrate and dispersed woody debris are commonly used forms of cover. Most juveniles migrate at the beginning of the third growing season into larger lakes or rivers. Bull char usually mature at age 5 to 6. Adult migration begins in early spring (March or April) and may extend through the entire summer. Most fish are in spawning streams by August. Some adults will spawn more than once during their lifetime, but they may not spawn each year (Pratt 1992).

Bull trout are present in several of the drainages proposed for spraying. Fluvial bull trout from the Kootenai River have been found at the mouth of Snow and Caribou Creeks (Paragamian 1994). Bull trout have also been located in Myrtle, Trout, Boundary, Grass, Parker, and Long Canyon Creeks. It is not known whether these fish are from resident or fluvial populations. The status of bull trout in the Kootenai River, below the Kootenai falls, is thought to be at a high risk of extinction (personal communication, Dave Cross).

__Westslope Cutthroat__ (Oncorynchus clarki lewisi)

Westslope cutthroat trout occur in clear, cool streams usually with water temperatures less than 17 degrees celsius. Cutthroat habitat contains rocky, silt-free riffles, for spawning and slow, deep pools with well vegetated stream banks for feeding and resting (U.S.D.A. 1989). They tend to occupy headwater areas especially when other salmonid species are present in the same stream (Hickman and Raleigh 1982). Cutthroat trout usually reach sexual maturity at age 3 to 4. They spawn in the spring, usually in April or May. Fry and juveniles occur in stream sections that are shallow with slow velocity flows. As fish grow larger and mature, they seek out deep water habitat types such as pools and deep runs (Hickman and Raleigh 1982; Baltz et al. 1991). During winter, cutthroat trout typically seek deeper water associated with large woody debris (Moore and Gregory 1988). Strong populations of this species exist in only 36% of its original range in Idaho (Rieman and Apperman, 1989).

Westslope cutthroat trout are present in most drainages of the Kootenai and Moyie River. Westslope cutthroat have not been found in McGinty, Gable, Twentymile, Cow, or Katka Creeks proposed for spraying. The status of populations in remaining watersheds proposed for spraying is unknown. In drainages where introduced rainbow and brook trout occur, long term

viability of westslope cutthroat may be in question (personal communications Dave Cross). In many cases this may not be due to solely introduced species. Instead, cumulative effects from fishing pressure, introduced species, and a depressed cutthroat population from managed disturbances have all played a part to tip the balance against cutthroat.

<u>Redband Trout</u> (Oncorhynchus mykiss gibbsi)

Redband Trout are a strain of rainbow trout that are native to the Kootenai River Basin. The mainstem Kootenai retains a hybrid mixture of redband/rainbow/cutthroat, but barriered tributaries may have headwater redband populations (U.S.D.A. 1994). Field evidence indicates that interior redband and westslope cutthroat generally coexisted below Kootenai Falls before exotic species were introduced. For the most part the two species were segregated spatially, but in sympatric situations they were able to maintain a high degree of genetic integrity. It is only where the coastal rainbows were introduced that we see hybrid swarms of rainbow-redband-cutthroat where few if any individuals are genetically pure.

The stocking of coastal rainbows (as early as 1914) has complicated the redband picture, as did the release of eastern brook trout, yellowstone cutthroat, and a host of other species (U.S.D.A. 1994). Redbands are generally found to be virtually extirpated through hybridization with introduced rainbows. In essence, in those places where someone has bothered to look for redbands, it looks like there are very few clues left to interpret about their status.

Preliminary results from genetic surveys conducted in 1994, located redband trout in only three of the nine streams surveyed. Saddle and Grass Creeks were found to contain genetically pure populations, while Boundary Creek has a 97% pure population (personal communication, Doug Perkinson).

<u>White Sturgeon</u> (Acipenser transmontanus)

White sturgeon are anadromous in the most of the larger rivers in which they occur but are landlock in the middle and upper Columbia River system. The Kootenai River population range includes lake and river habitats between the outflow of Kootenay Lake and Kootenai Falls upstream in Montana. Most fish have been found only in the Kootenai River, but a few have been located in larger tributary streams (Graham 1981). In 1989, a State of Montana enforcement officer cited an angler for taking of a sturgeon in the Yaak River (U.S.D.A. 1993). However, few have been sighted in other tributary streams .

Spawning period for white sturgeon occurs in May and June. Spawning probably occurs over rock or bedrock substrate in swift currents near rapids, when water temperatures are between 8.9 and 16.7 degrees celsius (Graham 1981). It is believed that that most spawning in the Kootenai River occurs in the canyon section between Bonners Ferry and Kootenai Falls. Sturgeons have not been identified in any of the tributary streams proposed for spraying.

<u>Other Species</u>

In addition to the above mentioned species, tributaries and lakes of the Moyie and Kootenai River support sculpins (Cottus), slimy sculpins (Cottus cognatus), redside shiner (Richardsonius balteatus), mountain whitefish (Prosopium williamsoni), kokanee salmon (Oncorhynchus nerka), rainbow trout (Oncorhynchus mykiss), peamouth (Mylocheilus caurinus), northern sqauwfish (Ptychocheilus oregonensis), pumpkinseed (Lepomis gibbosus), largemouth bass (Micropterus salmoides), yellow perch (Perca flavescens), crappie (Pomoxis), and brook trout (Salvelinus fontinalis).

__Direct, Indirect, and Cumulative Effects__

Manual treatment would result in localized soil disturbance. An increase in sediment to streams from the manual treatment along road cuts and fills and within the two riparian areas is possible, but the increase would likely be undetectable for several reasons. First, disturbed areas would be replanted with grass seed after treatment reducing erosion as roots became established . Second, not all sediment reaching ditchlines would be transported directly to streams. Many ditchlines are intercepted by relief culverts, which drain onto the forest floor. Finally, soil disturbance would be minimal and localized in comparison to the entire watershed.

Cultural treatments (seeding, transplanting, and fertilizing) would not effect fisheries. Fertilizers would be applied according to Forest Service and manufacture guidelines. Runoff nutrient concentrations therefore would not be large enough to enrich streams. Seeding and transplanting would involve limited soil disturbance. There are no cumulative effects with this alternative.

Effects from manual and cultural treatments are similar to those displayed in alternative 2. Release of biocontrol agents would have no direct effect on fisheries or surface water quality. The biocontrol agents would not compete with aquatic insect species since their food base is very specific, nor would they provide more than an incidental food source for fish. There are no cumulative effects with this alternative.

The herbicides proposed for use on these site are all characterized by relatively low aquatic toxicity. The 96-hour LC_{50} for the four herbicides is provided in Table 4-1. The 96-hour LC_{50} refers to the concentration that is lethal to 50 percent of the fish exposed at that level for 96 hours. The lower the LC_{50} the more toxic the compound.

Table 4-1.Toxic levels of herbicides to fish

Herbicide (test species)	96 hour LC50 (milligram/liter)	LC50 divided by 10	NOEL (milligram/liter)
Clopyralid (rainbow trout)	103	10.3	not available
2,4-D acid	24	2.4	not available

(cutthroat trout)			
2,4-D amine (rainbow trout)	420	42	not available
Dicamba (rainbow trout	28	2.8	not available
Picloram	3.5	0.35	0.29

Notes:2,4-D, dicamba, and picloram values are taken from Mayer and Ellersieck 1986 and Woodward 1976 and 1979. Clopyralid value is from Dow Chemical Company 1986.
2,4-D acid is the parent compound which is formulated in a variety of forms, including the amine which would be used under the 2,4-D alternative.

Although the LC_{50} is frequently used as a toxicity standard, fifty percent fish mortality is generally not acceptable. Because we often do not have long-term test results that provide safe concentrations or no-observed-effect levels (NOEL), the U.S. EPA has recommended that the 96-hour LC_{50} be divided by 10 to set a standard for concentrations to protect aquatic species (U.S. EPA 1986). Table 4-1 provides these concentrations, which are used as a benchmark to judge the significance of possible impacts. It is interesting to note that the NOEL for picloram developed from long-term laboratory studies corresponds fairly closely to the LC_{50} divided by 10 (see Table 4-1).

The second part of the risk analysis for aquatic species involves determining the possible herbicide concentration in streams. Field studies of pesticide spray operations have shown that pesticide input to streams ranged from non-detectible to 6 percent of the amount applied.

In order to predict the potential water quality impacts of herbicide applications on the sites under consideration, it is important to distinguish between infiltration-dominated sites and runoff-dominated sites. In all but the most severe conditions, rainfall percolates into the soil on an infiltration-dominated site. On a runoff-dominated site, rainfall is more likely to produce overland flow. These two classes of sites are differentiated on the basis of vegetative cover, soil type, degree of disturbance and compaction, and slope. The majority of the proposed treatment sites are runoff-dominated (road cuts and fills), except for Saddle Creek, where the majority of the proposed treatment sites are previously harvested stands adjacent to roads. Roads enhance runoff by concentrating flows on compacted road surfaces and ditches, intersecting groundwater flow from cut slopes, and using coarse material with low organic matter to create the fill slope. It was assumed that Saddle Creek sites are infiltration-dominated.

Based on a review of scientific studies of picloram runoff to streams, it is estimated that a maximum of 10 percent of the herbicide applied on a runoff-dominated site and 1 percent on an infiltration dominated site could be lost to the stream in a six hour period. Because of its relatively long environmental persistence and relatively low soil adsorption (high mobility), picloram represents the worst case of the herbicides analyzed here.

On this basis, the worst-case concentrations of herbicide can be calculated for drainages in the vicinity of the proposed treatment sites. The seasons entire application was calculated per drainage as if weeds were sprayed continuously along each road. In reality, approximately 40 percent or less of the distance along each road would be sprayed. It was assumed that the seasons application would all take place within a few days time and that a thunderstorm would wash 10 percent of the active ingredient into the stream over a six hour period. With this methodology, Meadow Creek showed the highest concentration of Picloram at 0.0287 mg/L (Table 4-3). Grass Creek showed the highest concentration of 2,4-D at 0.0690 milligrams per liter (a mg/L is equivalent to a part per million). These results are well below the estimated NOEL. With the water yield of these drainages, this analysis shows that 100 percent of the application rate scheduled for each drainage could be washed into the creek over a period of 6 hours and the concentration would still be less than NOEL.

Again it should be emphasized that these calculations represent a worst case scenario and the probability that these concentrations would be reached is very low. It is unlikely that any herbicide would be detected in stream water as a result of these spray operations because of the low level of herbicide use spread over a period of 2 months or more compared to the water yield in these drainages over the same period of time.

A report by Scott et al. (1976), of the Fish and Wildlife Service, concluded that a concentration of 0.6 ppm picloram decreased cutthroat fry growth by 25%. No adverse effects were observed when concentrations were below 0.3 ppm. Woodward (1979) concluded that picloram increased the mortality of fry in concentration above 1.3 ppm and reduced their growth in concentrations above 0.61 ppm. Worst case scenario concentrations calculated in Table 4-3 are well below these documented effect levels or the 0.35 mg/L concentration listed in Table 4-1.

Concentrations for clopyralid, dicamba, and 2,4-D that could enter streams under a worst case scenario are also low. The highest concentration of clopyralid, dicamba, and 2,4-D is .0209 mg/L, .0155 mg/L, and .3478 mg/L respectively. These are far below the LC_{50} divided by 10 value reported in Table 4-1.

When herbicides are applied, there is often concern that they will bioconcentrate in organisms through uptake and retention by tissue or gills. For this to occur, retention of a pollutant must exhibit a high resistance to breakdown or excretion by an organism to allow a sufficient uptake period for an elevated concentration. A high concentration must also be applied for an extended period of time. Bidlack (1980) studied channel catfish exposed up to 28 days to picloram at 1 ppm (mg/L). Analysis showed that picloram did not bioconcentrate. Each herbicide proposed has a worst case scenario concentration below 1 mg/L and would not be applied over an extended period. Therefore, there is a low risk of bioconcentrating.

Concern is sometimes expressed over the possible cumulative or synergistic effects of mixtures of chemicals on sensitive resources. Synergism is a special type of interaction where combined effect of a certain herbicide with other chemicals in the environment is greater than the effect of any one chemical alone. This issue is discussed in greater detail in the section on

Human Health Impacts. As noted there, EPA currently supports an additive model in predicting such interactions. Even with the assumption that the chemicals are present simultaneously, their additive concentrations are still well below the NOEL thresholds. Furthermore, where more than one herbicide is applied, the dosage would be reduced (personal communication, Bob Klarich). From the small does expected from this project, synergistic effects are not expected.

Herbicides can also indirectly influence fish populations by affecting the populations of other organisms upon which fish are dependent. Table 4-2 provides toxicity data for other aquatic organisms.

As indicated in Table 4-2, these herbicides are generally less toxic to lower orders of aquatic organisms than to fish species. Although the species listed in Table 4-2 are not the only aquatic organisms found in these waters, they are used by the U.S. Fish and Wildlife Service and the U.S. EPA as indicators of a wide range of aquatic organisms. Again, the worst-case concentrations of the herbicides in water are well below levels that would affect these organisms.

Table 4-2. Toxic levels of herbicides to aquatic organisms other than fish

Herbicide	Test Species	Test Results
Clopyralid	Daphnids (Daphnia sp.)	48 hr LC50 is 225 mg/L
Clopyralid	Ram's horn snail (Helisoma trivolvis)	No mortality after 48 hours in a solution containing 1 mg/L
Clopyralid	Green Algae (Selenastrum capricornutum)	96 hr LC50 is 61 mg/L
Clopyralid	Duck weed (Lemna minor)	No growth reduction at 2 mg/L after 21 days
2,4-D amine	Daphnia magna	48 hr LC50 is greater than 100 mg/L
2,4-D amine	Seed shrimp (Cypridopsis vidua)	48 hr LC50 is 8 mg/L
2,4-D amine	Scuds (Gammarus fasciatus)	96 hr LC50 is greater than 100 mg/L
2,4-D amine	Midges (Chironomus plumosus)	48 hr LC50 is greater than 100 mg/L
Dicamba	Daphnia magna	96 hr LC50 is greater than 100 mg/L
Dicamba	Sow bugs (Asellus brevicaudus)	96 hr LC50 is greater than 100 mg/L
Dicamba	Scuds (Gammarus fasciatus)	96 hr LC50 is greater than 100 mg/L
Dicamba	Shrimp (Palaemonetes kadiasis)	96 hr LC50 is 28 mg/L

Picloram	_Daphnia magna_	48 hr LC50 is 76 mg/L
Picloram	Scuds (_Gammarus fasciatus_)	96 hr LC50 is 27 mg/L
Picloram	Scuds (_Gammarus pseudolimnaeus_)	96 hr LC50 is 16.5 mg/L
Picloram	Stonefly (_Pteronarcys californica_)	96 hr LC50 is 4.8 mg/L

Values provided on this table are taken from Mayer and Ellersieck 1986 (2,4-D, dicamba, and picloram) and Dow Chemical Company 1986 and undated (clopyralid).

It must be recognized that Forest Service spraying is minimal compared to the overall use of herbicides. A demonstration that Forest Service spraying on a specific site is not affecting a specific aquatic resource does not exonerate all possible applications of these herbicides. The U.S. EPA has the overall responsibility for determining the possible aquatic and other environmental impacts of these herbicides under their registered use patterns. If unacceptable impacts are suspected, the EPA must require additional testing and monitoring under the pesticide registration process. During the registration or reregistration of these compounds, the EPA did not identify impacts to aquatic organisms as a major concern. In fact, the EPA continues to allow the application of some formulations of 2,4-D directly to water. The major surface water concern identified for picloram is the possible contamination of irrigation water and effects downstream on sensitive crops.

Municipal Watersheds

Spraying is proposed in two municipal watersheds above the water system diversion points. These streams are Caribou Creek and Myrtle Creek. The National Toxic Rule has set water quality standards for acceptable levels of compounds in surface water. The acceptable level of 2,4-D for domestic water supplies is 93 micrograms per liter (ug/L). The acceptable level of 2,4-D for waters that support organisms for human consumption is 790 ug/L.

The results of the worst case scenario discussed above were converted to ug/L. Under the worst case scenario, the concentration of 2,4-D for Caribou Creek was 5.1 ug/L and the concentration of 2,4-D for Myrtle Creek was 17 ug/L. Both figures are well below the acceptable level established by the National Toxic Rule. Again it should be emphasized that these calculations represent a worst case scenario and the probability that these concentrations would be reached is very low.

Table 4-3 Herbicide Concentrations mg/L (ug/L) Worst Case Scenario

Drainage	Clopyralid	2,4-D	Dicanba	Picloram
Boulder Creek	0.0068	0.0076	0.0016	0.0020
20 Mile Creek	0.0209		0.0111	

Caribou Creek	0.0005	0.0051(5.1)		
Snow Creek	0.0108	0.0193	0.0541	0.0051
Myrtle Creek	0.0028	0.0170(17)		0.0045
Ball Creek	0.0029	0.0189	0.0155	0.0048
Trout Creek		0.0524		0.0138
Smith Creek	0.0014	0.0477		0.0128
Boundary Creek		0.0651		0.0171
Meadow Creek		0.1025		0.0287
Grass Creek		0.0690		0.0181
Saddle Creek		0.03478		0.0092

Each seasons entire herbicide application was calculated per drainage as if weeds were sprayed continuously along each road in a matter of a few days. It was assumed that a severe thunderstorm could wash 10 percent of the active ingredient into the stream on runoff-dominated sites and 1 percent on infiltration dominated sites over a six hour period. The average cubic feet per second water yield for the month of July was used to calculate the liters of water produced during an average 6 hour time period. Herbicide application is conducted mid-May through early August, stream flow for the month of July was used as a worse case since the July flow is much lower than the June flow. Five year average guaged water yield was used to calculate the yields for Boulder, Smith and Boundary Creeks. The yield per acre of drainage from these drainages was used to calculate an estimated cfs water flow for the remaining drainages.

Best Management Practices

Rule 6 of the Rules and Regulations Pertaining to the Idaho Forest Practices Act Title 38, Chapter 13, Idaho Code pertain to the use of chemicals. The purpose of these rules is to regulate handling, storage and application of chemicals in such a way that the public health and aquatic and terrestrial habitats will not be endangered by contamination of streams or other bodies of water. The rules have generally been adopted by the Forest Service as standard operational procedures.

There is one exception. One rule requires that at least 25 feet be left untreated on each side of all Class I steams, flowing Class II streams and areas of open water. As discussed in Chapter III, there are two locations where treatment of meadow hawkweed is proposed within this zone, Trout Creek and Grass Creek. For these cases, a Request for Forest Practice Variance will be filed with the Idaho State Department of Lands. The request will be to use forms of the herbicide 2,4-D that have been certified for use over water within this zone. The herbicide would not be sprayed directly on water but would be spot sprayed by hand directly on hawkweed plants up to the edge of the water.

In summary, the direct, indirect, and cumulative water-quality impacts of these projects would be minimal. Under reasonable assumptions, it can be concluded that no herbicides would be detected in surface water at the part-per-billion detection limit, if a decision were made to apply herbicides. Effects on aquatic organisms under normal-use scenarios should not be detectable, although monitoring would continue to test this assumption.

The impacts could be more serious in the event of a spill of herbicides directly into a small stream. It is not possible to predict the concentration or duration of contamination in advance. However, a spill could result in localized fish mortality, especially to young fingerlings, or mortality to the early developmental stages of other aquatic organisms.

7. **Determination of Effects**

Given the low concentrations which could enter streams, even under the worst case scenario, the proposed action will have no effect on sensitive fish species.

8. **Recommendations and Conditions**

No conditions or recommendations are needed for the determination.

9. **Consultation With Others and References**

Informal consulation with Bob Klarich, Bonners Ferry, Idaho Panhandle National Forest, 5/30/95; Dave Cross, Forest Fisheries Biologist, Idaho Panhandle National Forest, 5/5/95; Doug Perkinson, Forest Fisheries Biologist, Kootenai National Forest, 5/3/95.

Allendorf, F.W., and R.F. Leary 1988. Conservation and distribution of genetic variation in polytypic species, the cutthroat trout. Conservation Biology 2:170-184.

Baltz, D.M., B. Vondracek, L.R. Brown, and P.B. Moyle. 1991. Seasonal changes in microhabitat selection by rainbow trout in a small stream. Transaction of the American Fisheries Society 120:2:166-176.

Bidlack, H.D., 1980. Kinetics of "Aged" Picloram in a Model Aquatic Microcosm. The Dow Chemical Company.

Bilby, R.E. and J.W. Ward. 1989. Changes in characteristics and function of woody debris with increasing stream size in western Washington. Transactions of the American Fisheries Society. 118:368-378.

Gorman, O.T., and J.R. Karr. 1978. habitat structure and stream fish communities. Ecology 59:507-515.

Graham, P. 1981. Status of White Sturgeon in the Kootenai River. Montana Fish, Wildlife, and Parks. Kalispell, Montana.

Griffith, J.S. 1988. Review of competition between cutthroat trout and other salmonids. American Fisheries Society Symposium 4:134-140.

Hicks, B.J. 1990. The influence of geology and timber harvest on channel morphology and salmonid populations in Oregon Coast Range streams. Doctoral dissertation. Oregon State University, Corvallis.

Hickman, T., and R.F. Raleigh. 1982. Habitat suitability index models: Cutthroat Trout U.S.D.I. Fish and Wildlife Service, FWS/OBS-82/10.5. WELUT, Fort Collins, Colorado. 38 pages.

Irving, D.B. 1987. Cutthroat trout abundance, potential yield, and interaction with brook trout in Priest Lake tributaries. Master's thesis, University of Idaho, Moscow, Idaho.

Kappesser, G. 1991. The use of wolman pebble counts and channel geometery to define channel stability. USDA Forest Service, Idaho Panhandle National Forest, 8 p.

Moore, K.M.S., and S.V. Gregory. 1988. Summer habitat utilization and ecology of cutthroat trout fry in Cascade Mountain Streams. Canadian Journal of Fisheries and Aquatic Sciences 45:1921-1930.

Partridge, F. 1983. River and stream investigations. Study VI: Kootenai River Fisheries Investigations. Project F-73-R-5. Idaho Department of Fish and Game.

Pratt, K.L. 1992 A review of bull trout life history. Pages 5-9 in P.J. Howell and D.V. Buchanan, editors. Proceedings of the Gearhart Mountain Bull Trout Workshop.

Rieman, B.E., and K. Apperson, 1989. Status and analysis of salmonid fisheries, westslope cutthroat trout and analysis of fisheries information. Idaho Dept. of Fish and Game. pp 1-18.

Scott, T.G., H.C. Schultz and P.H. Eschmeyer. 1977. Fisheries and Wildlife Research. United States Fish and Wildlife Service, U.S. Printing Office, Denver, Co. Form # 024-010-0047-1.

U.S.D.A., Forest Service. 1994. Letter to Biodiversity Legal Foundation on Redband Lifehistory in the Kootenai Drainage. Kootenai National Forest, Northern Region.

U.S.D.A., Forest Service. 1993. Letter signed by Regional Forester on White Sturgeon 10-19-93.

U.S.D.A., Forest Service. 1991. Update on Northern Region sensitive species list. Letter signed by the Regional Forester, 5/17/91.

U.S.D.A., Forest Service. 1989. Caring for our natural community: Region 1 - Threatened, Endangered and Sensitive Species Program. U.S.D.A. Forest Service, Northern Region.

Woodward, D.F. 1979. Assessing the Hazard of Picloram to cutthroat trout. Journal of Range Management. 32:230-232.

10. **List of Preparers**

Reviewed By: *John C. Chatel* Date: *6-7-95*
John C. Chatel
Zone Fisheries Biologist

United States Department of Agriculture
Forest Service
Bonners Ferry Ranger District
(208)267-5561
Route 4, Box 4860
Bonners Ferry, ID 83805-9764
FAX (208)267-7423

Reply to: 2672.41

Date: June 2, 1995

Subject: Noxious Weed EIS
Threatened and Endangered Species Draft Biological Assessment

To: District Ranger

Introduction

The U.S. Fish and Wildlife Service (USF&WS) list (FWS-1-4-93-SP-NI-(9-15) dated June 1, 1995 lists five threatened or endangered species that may occur on the Bonners Ferry Ranger District: Bald Eagle, Gray Wolf, Woodland Caribou, Grizzly Bear, and Peregrine Falcon. This Biological Assessment (BA) addresses these five species for the Weed Environmental Impact Statement area.

The Bonners Ferry Ranger District proposes to control noxious weeds in certain areas on the district where control programs still have a chance of success. Control alternatives include non-chemical and chemical treatment methods under an Integrated Pest Management program.

In the past several years the Bonners Ferry Ranger District has conducted extensive inventories of noxious weeds on large portions of the ranger district. The district has also been treating noxious weeds as directed in the Idaho Panhandle National Forest Weed Pest Management EIS. District personnel have searched all suitable and likely locations including travel corridors, campsites, and vulnerable habitats.

Currently 41 sites with noxious weeds have been identified. Sites range in size from 0.24 acres to 33 acres and total 335.55 acres. This area represents less than 0.08 percent of the four hundred ten thousand acres of National Forest System lands administered by the Bonners Ferry Ranger District. It is important to note that on many of these sites the infestations of noxious weeds are still very scattered, and not all of these acres would require treatment. For example, the largest site is 13.8 miles of road in the Smith, Cow, and Beaver Creek drainages where infestations of primarily meadow hawkweed can be found along the road.

Sites have been grouped into one of 3 "geographical ecosystems". Three of the geographical ecosystems are physically separated by either the Kootenai River or the Purcell Trench. Each of the three is associated with a particular mountain range, namely the Purcells, the Cabinets, or the Selkirks. Site maps are provided in Appendix A.

38 of the forty-one sites are infested with meadow hawkweed (*Hieracium pratense*)) or combinations of meadow hawkweed and spotted knapweed

Centaurea maculosa). Two of the sites are infested with Rush Skeleton Weed (Chrondrilla juncea), found in but three sites in Boundary County. One site, Roman Nose Lake #3, is infested with common tansy (Tanacetum vulgare). Ten other sites are infested with common tansy along with hawkweed, spotted knapweed, or thistles. Three sites are infested with yellow toadflax (Linaria vulgaris).

Twenty-five of the 41 sites are located in the Selkirk Ecosystem. Five sites are located in the Cabinet Mountains Ecosystem and seven sites are located in the Purcell Mountain ecosystem. Three sites are identified in the valley outside the three mountain ranges.

The preferred treatment varies by site and can include either chemical, biological, or manual treatment or combinations of these treatments. A complete listing of preferred methods is provided in Table 2-1 (p. 2-8) of the EIS.

Weed control is proposed in order to accomplish the following. 1) Protect the natural condition and biodiversity of the Selkirk and Cabinet Mountain Ecosystems by preventing the spread of aggressive, non-native plant species that displace native vegetation. 2) Prevent or limit the spread of noxious weeds in key low elevation lakes in the Purcell Mountain ecosystem. Lakes to be protected are Brush Lake, Dawson Lake, Robinson Lake, and Smith Lake. Campgrounds at these lakes under Forest Service jurisdiction and other campgrounds within this ecosystem will be targeted for weed control action. 3) Comply with Federal and State Laws regulating management of noxious weeds. 4) Cooperate with other agencies and private individuals concerned with the management of noxious weeds.

Determination of Effect

Peregrine Falcon: Peregrine falcons nest on cliff ledges, rock outcrops or steep talus slopes. There are no known nest territories on the Bonners Ferry Ranger District, and few large cliffs which would provide suitable breeding habitat. There are no known historic peregrine sightings from the project area.

Peregrine falcons are the classic endangered species affected by pesticides. However, the pesticides that were the nemesis of peregrines are persistent chlorinated hydrocarbons that bioaccumulated in fatty tissues, causing eggshell thinning and a drastic decline in nesting productivity.

Based on the lack of suitable breeding habitat, the absence of known peregrines, the distance any spraying activity would be from any likely nesting cliff, and the relatively rapid breakdown rates of the herbicides proposed for treatment, the proposed project would have no effect on peregrine falcons.

Bald Eagle: The entire district is within the recovery zone of the bald eagle. According to the USF&WS (Letter, 9/16/92), "the bald eagle should be reviewed" if a search of a 3.1 mi (5 km) zone around the project boundary reveals a previously recorded nesting territory.

No known winter roost sites are near the proposed treatment areas. Disturbance in these areas would not be a factor because the time of year that spraying would occur is in spring and summer.

There are two known eagle nests within these distances. One is the Robinson Lake territory, which is occupied by a pair of eagles highly habituated to human activities. The other nests along the upper Kootenai River near Katka.

Disturbance is an issue with nesting bald eagles. The pair at Robinson Lake has been shown numerous times to be tolerant of human activity, especially in the campground and on the trails. These are the areas that will be treated in this project, with few if any outside of known use areas. The Kootenai River territory is probably less habituated to human presence, and would possibly be disturbed by continuing presence. However, spraying is a short duration and relatively quiet activity. Disturbance can be kept to a minimum by following the conservation requirements below.

The herbicides proposed will not directly affect this species if applied at the recommended rates and quantities identified in the EIS. The chemicals selected for this proposal are water soluble, therefore, the extent of bioaccumulation is insignificant. These herbicides are rapidly excreted by animals that might receive a small dose from contacting or consuming sprayed vegetation. Although none of these herbicides have been tested on threatened or endangered species of concern here, tests on surrogate species indicate that the compounds are only slightly toxic to these species.

Based on the lack of suitable habitat at the project sites (except as noted), and the lack of toxicity, bioaccumulation potential, and degree of exposure to the herbicides proposed, this project is expected to have <u>no effect</u> on the bald eagle or its habitat. For the two locations near known nest territories, this project is <u>not likely to adversely affect</u> bald eagles or their habitat.

<u>Gray Wolf</u> : Northern Idaho has been identified as a travel corridor to allow wolves to disperse from Canada and travel down to the Central Idaho Wolf Recovery Area (CIWRA). According to Hansen (1986) the "entire northern Idaho/northwestern Montana border area should be considered important to wolf conservation in northern Idaho and ultimately to wolf recovery in central Idaho".

The USF&WS (Letter, 9/16/92) recommends that the gray wolf be reviewed in areas outside of the CIWRA if "a search of the project area and a 6.2 mile zone around the project boundary reveals previously recorded wolf sightings". Wolf sightings are distributed across the Bonners Ferry Ranger District. No den locations have been recorded, and most sightings indicate transient animals. However, denning animals are expected within the next few years.

The Forest Plan states for wolf habitat that "in areas of reported occurrence, consider maintenance of a high number of prey species (deer, elk) and maintenance of security through road management".

The primary effect of noxious weeds on wolves is their effect on the ungulate herbivore prey they depend on. As noted in the EIS, displacement of native forage plants with non-nutritious noxious weeds is detrimental to ungulates. This effect is more likely to cause a problem with wolves than the direct effect of either the chemicals themselves or the disturbance of the people applying the chemicals. Disturbance is controlled by administrative use guidelines behind closed gates, and for those sites within bear units, security is higher than in non-bear units.

The toxicity of these compounds on wolves has not been tested directly. However, these compounds have been tested on dogs, as reviewed in the Human Health Risk Analyses referenced in Chapter 4 of the EIS. Due to the small and widely distributed herbicide treatment sites, it is unlikely that wolves would be exposed to these chemicals. Potential doses to wolves either from the direct contact with treated vegetation or from consumption of animals that have consumed treated vegetation are well below toxic levels. These herbicides are excreted rapidly through the kidneys in ungulates, the process taking up to five days at most (see Human Health Risk Analyses referenced in Chapter 4 of the EIS). These herbicides do not bioaccumulate in fat tissues (as would an organochlorine insecticide).

Based on the previous analysis, the proposed weed control activities would have no effect on wolves or their habitat.

Woodland Caribou: Portions of the project area lie within the designated woodland caribou recovery area. Woodland caribou would not be directly affected by the increase and spread of noxious weeds due to displaced habitat. Spraying and disturbance would be the two most likely effects of the noxious weed control program.

As noted for other ungulates, evidence does not exist that the proposed chemicals are either toxic or detrimental to health or reproductive potential. For caribou, this is especially true, because the amount of spraying necessary in the areas occupied by caribou is small. Additionally, caribou dine on different forage plants than many other ungulates, often preferring huckleberries or angelica instead of species mixed with those likely to harbor noxious weeds.

Based on the above analysis, the proposed weed control activities would have no effect on caribou or their habitat.

Grizzly Bear: The project area encompasses several Grizzly Bear Management Units (GBMU) across the district.

The bear is not likely to be affected directly by use of the proposed herbicides. The proposed sites to be treated with herbicides are relatively small, and not generally in areas known to be favored by bears, although there are a few sites in important bear areas. Noxious weeds are

not known to be part of grizzly bear foraging diets (Grizzly Bear Compendium 1987). Some incidental exposure could occur if bears graze on treated non-target vegetation. Immediately after treatment concentration on grass and leaves could range from 50 to 150 parts per million. These concentrations would be quickly reduced either through photodegradation or rainfall. Although these herbicides have not been tested on bears, tests on other mammalian species at much higher concentration and for longer periods have shown no ill effect.

The major effect from noxious weed control activities would be from the access needed behind gates to control sites there. Administrative use guidelines are developed for such activities and are strictly adhered to. Spraying can be accomplished well within administrative use timelines because of the short time involved. Mortality risk associated with the proposed activity due to an increase in human activity in the area would be minimized through scheduling restrictions.

No past, present or reasonably forseeable actions, when considered with this project, would cause cumulative effects greater than the direct and indirect effects considered individually.

Based on the above analysis, the proposed timber management activities are <u>not likely to adversely affect</u> the grizzly bear or its habitat.

<u>CONSERVATION REQUIREMENTS</u>

The following should be done to ensure that the findings of <u>not likely to adversely affect</u> is valid.

Grizzly Bear:

Where it is necessary for herbicide applicators to camp in bear country:

a. Utilize bear proof storage containers for human and livestock foods.

b. Store foods away from sleeping areas.

c. Suspend foods/garbage at a minimum of 10 feet above ground and four feet from the tree used for suspension.

d. Proper menu planning to eliminated excessive left over foods.

e. Cooking and eating should be done away from sleeping areas.

f. Proper cleanliness of cooking facilities, including removal of all cooking residues.

Bald eagle:

1. In the Katka vicinity only (T61N, R3E, Sections 5, 6, 8,9), the following requirements apply. Plan spraying so that it is done as quickly and quietly as possible. Spray in the middle of the day, if possible, since eagles tend to be more apathetic to disturbance at this time. During some years, these precautions may not be necessary, and they may be waived upon consultation with the district wildlife biologist.

PREPARED BY: Sandra Jacobson

SANDRA L. JACOBSON
District Wildlife Biologist

Literature Cited

Hansen, J. 1986. Wolves of Northern Idaho and Northeastern Washington. MT Coop. Wldf Research Unit. USF&WS. 88 pp. pages 36, 51, 72, 73, & 81.

Northern Rocky Mountain Wolf Recovery Plan (NRMWRP). 1987. USF&WS. 119 pp. page(s) 73.

USF&WS. Letter dated September 16, 1992. Subject: Species List Requests for Fiscal Year 1993.

Interagency Grizzly Bear Committee. 1987. Grizzly Bear Compendium. U.S. Fish and Wildlife Service, Missoula, MT. 56 pp.

USDA Forest Service. 1993. Draft Environmental Impact Statement,Noxious Weed Projects, Spotted Bear and Hungry Horse Ranger Districts. Hungry Horse, MT.

United States Department of Agriculture
Forest Service
Bonners Ferry Ranger District
(208)267-5561
Route 4, Box 4860
Bonners Ferry, ID 83805-9764
FAX (208)267-7423

Reply to: 2672.41

Date: June 2, 1995

Subject: Noxious Weed EIS
Sensitive Species Draft Biological Evaluation

To: District Ranger

Introduction

The Regional Forester for Region 1 of the Forest Service has designated certain wildlife species as sensitive. These species may warrant this designation for a variety of reasons, such as extremely limited or fragile habitat, continuing or past habitat reduction or limited reproductive potential. There are eleven species so designated that occur or whose habitat may occur on the Bonners Ferry Ranger District. These are Coeur d'Alene Salamander, common loon, harlequin duck, boreal owl, flammulated owl, black-backed woodpecker, lynx, fisher, wolverine, Townsend's big-eared bat, and northern bog lemming.

Refer to the introduction of the Noxious Weed EIS Biological Assessment (for threatened or endangered wildlife) for a summarized description of the project.

Determination of Effect

Coeur d'Alene Salamander

The known geographic range of the Coeur d' Alene Salamander is in northern Idaho and northwestern Montana. As research continues, it is being discovered in many new locations (Manno, pers. comm.). Coeur d' Alene salamanders inhabit splash zones of spring seepages over rock faces along roads, waterfall spray zones, and edges of streams beneath moist rocks (Groves 1988, p. 5). They occur in wet, humid, and cool microhabitats containing fractured bedrock or gravel that provides shelter and retains moisture (USDA 1989, p. 40). In the northern part of its range in Idaho (Cabinet and Purcell Mountains) the lack of fractured rock types is probably the major factor in limiting the species' distribution (Groves, 1989 p. 4). Sharply fractured rock formations are often associated with Belt Rock formation but can also occur in other geologic types. Most of the suitable habitat of this description falls within the Purcells and Cabinet Mountain Ranges for the project area.

Because riparian areas are being sensitively handled for this project, it is unlikely that this species would come into direct contact with any of the herbicides to be used. Further, the weeds targeted do not normally occur in rock cliffs or seepy rock faces, although they may occur in the

ditches alongside roads, where salamanders also occur. Precautions noted to protect water quality would be adequate protection for this species.

Cumulative or indirect effects would be probably greater without noxious weed control than with it, since the spread of less erosion-controlling plants such as knapweed may indirectly affect water quality.

The proposed noxious weed treatment activities would have <u>no effect</u> individually or cumulatively on the Coeur d'Alene salamander or its habitat.

<u>Common Loon</u>

The geographic breeding range of the common loon extends from the southern coast of Iceland south throughout most of Canada, Alaska, and the northern border states. Loons are large, heavy-bodied birds with their legs and feet positioned far to the rear allowing them to propel quickly through water but unable to walk well on land. Lakes suitable for nesting are 10 acres or larger with emergent shoreline vegetation and secluded areas for nesting and brood rearing. Only a few lakes on the district meet these criteria, and most are low elevation. There is no suitable habitat for common loons immediately adjacent to any treatment area, however several potentially suitable nesting lakes are near treatment sites. These are Dawson, Brush, Smith, Bussard and Robinson Lakes.

Common loons have not been recorded as breeders in Boundary County for many years. Disturbance at nest sites is the likely cause. Once the lakes become extirpated, recolonizers would have a difficult time locating suitable nests again in this area where suitable lakes are relatively rare.

Loons forage on small fish. The greatest likelihood of the project affecting this species would be if the forage species were affected. As noted elsewhere, fish are not likely to be affected by the chemicals proposed. Because they do not bioaccumulate, loons would therefore also not be affected in this manner.

There would be no cumulative effect associated with past, present, or reasonably foreseeable future actions.

The proposed noxious weed treatment activities would have <u>no effect</u> individually or cumulatively on the common loon or its habitat.

<u>Harlequin Duck</u>

The western geographic range of the harlequin duck extends south from Alaska to portions of the northwestern United States and California. Harlequin ducks winter on the ocean and migrate inland to breed. They are generally associated with fast flowing streams which are 10 meters wide or greater during the breeding season (Cassirer & Groves 1990, p. 8).

Harlequin duck habitat does occur on the district and there are recent records of breeding. As in common loon and Coeur d'Alene salamander,

water-associated effects would be minimal because of project design. Harlequin ducks forage on invertebrates which, because of their short life-cycle, generally do not have time to bioaccumulate pesticides. In turn because of this and because the project chemicals do not bioaccumulate, the risk to harlequin ducks directly or indirectly is immeasurable.

There would be no cumulative effect associated with past, present, or reasonably foreseeable future actions.

The proposed noxious weed treatment activities would have <u>no effect</u> on the harlequin duck or its habitat.

<u>Townsend's Big-eared Bat</u>

The geographic range of Townsend's big-eared bat extends throughout western North America, from British Columbia south to southern Mexico, eastward to South Dakota and western Texas with isolated populations in the southeast United States. Townsend's Big-eared Bats have been found in a wide variety of habitats, from arid juniper/pine forests to high-elevation mixed-coniferous forests (USDA, 1989 pg. 38). Caves and cave-like structures are a critical habitat for this species, both as hibernacula in the winter and as roosts for summer nursery colonies (ODF&W, 1987, pg. 27). They occasionally use bridges and old buildings for roosting and in some places have been known to use building attics as nursery sites (Perkins, 1992 p. 9). They are typically found in shrub-steppe or forest edge (Notes of MT Bats, 1992). Foraging habitat is not well known but preliminary data suggests they forage along cliff faces and along small stream corridors in forested habitats (Perkins, pers. comm.). Other foraging habitat may include forest edges and openings, riparian areas where flying insects are abundant, and there are no obstructions to flight. Loss and disturbance of hibernacula and roosting habitat is the limiting factor for Townsend's big-eared bats.

Natural cave habitat is virtually nonexistent on the Bonners Ferry Ranger District because of the lack of limestone. Hibernacula temperature and humidity requirements are so specific that it is unlikely that Townsend's big-eared bats occur on the District because of lack of over-winter habitat. There are no caves or mine adits in the assessment area or in the vicinity.

Because of lack of suitable habitat the proposed noxious weed treatment activities would have <u>no effect</u> on the Townsend's big-eared bat or its habitat.

<u>Northern bog lemming</u>

The geographic range of the northern bog lemming extends from southern Alaska, throughout most of Canada and into northern Washington, Idaho, and Montana. The only known location of the northern bog lemming on the Bonners Ferry Ranger District is in a subalpine boggy meadow in the Selkirk Mountains. Northern bog lemmings typically inhabit sphagnum bogs, but are also occasionally found in mossy forests, wet sub-alpine meadows, and

alpine tundra (Reichel and Beckstrom, 1993 p.1). According to the most current research in Montana, sphagnum mats are the most likely sites in which to find new bog lemming populations (Reichel and Beckstrom, 1993).

As with the other wetland-associated species in this analysis, the protections associated with water quality should adequately protect this species from any chemical risk associated with water. This species is not likely to be present in most of the areas infested with the targeted noxious weeds, since it occurs in either very moist habitats or old-growtth cedar, so its direct exposure should be virtually nil.

There would be no cumulative effect associated with past, present, or reasonably foreseeable future actions.

Based on the above analysis, the proposed weed treatment activities would have <u>no effect</u> individually or cumulatively on the northern bog lemming or its habitat.

<u>Black-backed Woodpecker</u>

The geographic range of the black-backed woodpecker extends south from Alaska to central California and Nevada and throughout most of the northern United States. Black-backed woodpeckers nest in snags or in live trees with heartrot which are at least 5 inches in diameter. They often use clumps of snags for nesting, and are known to nest in spruce, lodgepole pine, aspen, ponderosa pine, Douglas-fir, and western larch (Thomas 1979, p. 381; Harris 1982, p. 52, 53, & 60). Black-backed woodpeckers feed primarily on wood-boring beetles and specialize on large areas of recently killed, beetle infested timber. Breeding densities of black-backed woodpeckers vary considerably in response to prey availability, increasing up to 7 times the normal level during beetle epidemics (Jackman 1975, p. 101).

Because this species is associated primarily with snags and the insects that live in them, it would not be affected by either the vegetation change or the chemical treatments proposed. Based on this, the proposed weed treatment activities would have <u>no effect</u> on woodpeckers or their habitat.

<u>Flammulated owl</u>

The geographic breeding range of the flammulated owl extends from southern British Columbia throughout most of the western states but not along the coast. Flammulated owls are known to occur in Boundary County (District files). They occur in ponderosa pine and Douglas-fir forests with fairly open canopies (typically 35-65% closure) and snags at least 12" dbh. Nesting stands are at least 35 acres in size.

Flammulated owls are dependent on appropriately-sized snags for nesting and flying insects as prey. Neither of these life attributes would be affected by the proposed weed treatments. There would be no cumulative effect associated with past, present, or reasonably foreseeable future actions.

Based on the above analysis, the proposed noxious weed treatment activities would have no effect on flammulated owls and their habitat.

Boreal Owl

The geographic range of the boreal owl in North America extends from Canada and Alaska and throughout the northern Rocky Mountains in eastern Washington, Idaho, Montana, Wyoming and Colorado. Boreal owls inhabit the spruce fir and upper cedar hemlock zone in North Idaho. Mature and older conifer forests are suitable for nesting and foraging, and immature forests are used for foraging.

As with the previous species who depend mostly on forest components such as snags, boreal owls would be unlikely to be directly affected by either the presence of weeds or the use of chemicals to control them. Indirectly, the presence of noxious weeds may affect the quantity of rodent prey if an infestation is too severe, however, the likelihood is that boreal owls are limited by nest sites rather than prey base and an infestation affecting rodent numbers would have to be serious indeed to switch this to the limiting factor.

Based on the above analysis, the proposed weed treatment activities would have no effect on boreal owls or their habitat.

Lynx

The geographic range of the lynx is widespread through the boreal regions of North America, Europe, and Asia, throughout most of Alaska and Canada and southward on the high elevation spine of the Cascades and Rocky Mountains into Washington, Idaho, Monata, Wyoming, Colorado, and Utah. Lynx generally maintain home ranges of between 5 and 20 square miles, but ranges as large as 122 square miles have been documented (Bender-Retie FEIS, 1991 p. A10-A20). According to Koehler (1990, p. 845-851), lynx in Washington used higher elevations in the summer than during the winter with the lowest elevation being about 4500'. Denning habitat in Washington consisted of mature or old-growth spruce/fir with a mix of lodgepole pine (Koehler, 1990, p. 845-851). Denning stands may be quite small (less than 5 acres in some cases) but must be interconnected by forested cover (Koehler and Brittel, 1990, p. 10-14). Other higher elevation mature and older stands likely provide denning habitat also.

Snowshoe hare are the primary prey species of lynx. In Washington, hares are most abundant in young forests (approximately 20 years), usually lodgepole pine or other habitats with dense tree or shrub understory (Koehler, 1990, p. 845-851). Some portions of the project area occur within areas potentially inhabited by lynx.

As with the other species dependent on forested areas, lynx would not be directly affected by either the presence of noxious weeds nor the control programs to remove them. Snowshoe hare may be indirectly affected by the spread of weeds if such spread reached a point that its native forage

species were affected; however, many of these plant species would not be affected by noxious weeds (such as lodgepole pine seedlings). As previously noted, although no direct studies have been made on toxicity to lynx, since the chemicals break down rapidly and there is no bioaccumulation, the direct or indirect effects from the pesticides should pose no threat to this species.

Based on the above analysis, the proposed treatment activities would have no effect on lynx and its habitat.

Wolverine

Today the wolverine ranges from Alaska, most of Canada, and parts of the northwestern United States. Wolverine are a wide-ranging member of the Mustelid family. They inhabit "high elevation, mature coniferous forests with openings" and prefer "rocky places with scattered pockets of timber" (Groves, 1989, p. 2 & 30). In Northwestern Montana they selected subalpine fir habitat and "large areas of medium or scattered mature timber". They avoided areas of "dense, young timber" and were rarely in large open areas. They also require remote habitat with minimal human activity and appear to select basically roadless areas. They feed on a variety of small mammals but also rely heavily on carrion.

Incidental trapping poses a threat to wolverine populations. None of the alternatives, would significantly increase the potential of trapping.

As with the other carnivores discussed, the largest potential threat from chemical noxious weed control is from ingestion and poisoning of chemicals, a concern especially since the wolverine is a scavenger of carrion. Again, bioaccumulation and direct toxicity are not problems with the chemicals selected.

Disturbance from weed spraying crews may occur but this would be minimized by conformance with district administrative use guidelines. No increase of mortality risk would occur from this disturbance.

No past, present or reasonably forseeable actions, when considered with this project, would cause cumulative effects greater than the direct and indirect effects considered individually.

Based on the above analysis, this proposed noxious weed treatment activities would have no effect on wolverine or its habitat.

Fisher

The fisher was extirpated from most of its range by the early 1900s. It now occurs from southern Canada south into the northwestern states and California and the Great Lake states. Research in various areas indicates fishers prey on a large variety of small mammals and carrion (Arthur et al., 1989, p. 680) and they are closely associated with seral to old growth coniferous forests. In northcentral Idaho, grand fir and spruce forests were preferred by fishers (Jones, 1991 p. 89-92) and elevations from

approximately 3000 to 5000 feet were used. They are thought to predominantly inhabit mid elevations in this area (Johnson pers. comm., 1991). Fisher also need late successional habitats "linked together by closed-canopy forest travel corridors" (Jones, 1991 p. 89-92). Large diameter spruce and grand fir snags and large downed material are used for denning and foraging. Fishers prefer habitats with high canopy closure (>80%), and "avoid areas with low canopy closure (less than 50%)" (Powell, 1982, p. 88). During the winter they appear to use 80-100 year old Douglas-fir and lodgepole pine forests in addition to the above.

Fishers use riparian areas because of their travel corridor value with dense overhead cover, and foraging opportunities. Neither of these have any direct tie to noxious weeds. Although fisher will eat carrion, some from large animals, most prey items are small rodents. The danger to fishers from an occasional carrion meal would be even less than that described for wolverine because of the lesser frequency of it and, as described, the low risk imposed by the chemicals anyway.

There would be no increase in trapping risk imposed by this project.

Based on the above analysis, the proposed weed treatment activities would have <u>no effect</u> on fisher or their habitat.

CONSERVATION REQUIREMENTS

There are no conservation requirements mandatory to the determination of no effect for this project.

Prepared By: Sandra Jacobson
SANDRA L. JACOBSON
District Wildlife Biologist

LITERATURE CITED

Arthur, Stephen M. 1989. Habitat use and diet of fishers. Journal of Wildlife Management 53(3):680-688.

Bender-Retie FEIS. 1991. Bender-Retie Timber Sale Final Environmental Impact Statement, Beaverhead National Forest. pages A10-A20.

Bull, E. Perterson, S., and Thomas, J.W. 1986. Resource Partitioning Among Woodpeckers in Northeastern Oregon. Excerpts from PNW-144.

Cassirer, E. Frances and Craig R. Groves. 1990. Distribution, habitat use and status of harlequin ducks (Histrionicus histrionicus) in northern Idaho, 1990. Idaho Dept. of Fish and Game. Natural Heritage Section.

Copland, Jeff. 1994. Personal Communication regarding wolverine.

Groves, Craig. 1989. Status an distribution of the Coeur d' Alene Salamander (Plethodon Vandykei Idahoensis) in Idaho - Part 2. Idaho Dept. of Fish and Game Nongame Report, February 1989.

Groves, Craig. 1989. The wolverine wilderness symbol. Idaho Wildlife. Fall, 1989. pp. 2 & 30.

Groves, Craig. 1988. Status and distribution of the Coeur d'Alene salamander (Pletnodony vandykei idahoensis) in Idaho. Idaho Dept. of Fish and Game Nongame Report, February 1988.

Harris, M. 1982. Habitat Use Among Woodpeckers in Forest Burns. Masters Thesis, Univ of Montana. 61 pp.

Jackman, Siri Marion. 1975. Woodpeckers of the Pacific Northwest: their characteristics and their role in the forests. M.S. Thesis. Oregon State University. 147 pp.

Johnson, Greg. 1991. IDF&G Conservation Officer. Personal communication regarding fisher.

Jones, Jeff. 1991. Habitat use of fisher in northcentral Idaho. M.S. Thesis, University of Idaho. 146 pp.

Jones, Jeff. Personal Communication regarding fishers, Western Forests Furbearer Meeting, March 15, 1994.

Koehler, Gary M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. Canadian Journal of Zoology 68(5):845-851.

Koehler, G.M. and Brittell, J.D. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. J. Of Forestry. 88(10):10-14.

Manno, Sam. Personal Communication regarding Amphibians and Coeur 'd Alene Salamanders, Region 1 Wildlife Congress, February 3, 1994.

Notes on Montana Bats. January 21, 1992.

ODF&W. 1987. Distribution, Status, and Habitat Affinities of Townsend's Big-Eared Bat (Plecotis townsendii) in Oregon. Technical Report # 86-5-01. p.27.

Perkins, Mark. Personal Communication regarding Townsend's big-eared bat. February, 1994.

Powell, R.A. 1982. The Fisher Life History, Ecology, and Behavior. University of Minnisota Press, Minnesota. 217 pp.

Reichel, J. & Beckstrom, S. 1993. Northern bog lemming survey, 1992. A Report to: USDA Forest Service, Kootenai National Forest. MT Heritage Program.

Thomas, Jack Ward, et al. U.S.D.A.-Forest Service Agriculture Handbook No.553. Wildlife habitats in managed forests: the Blue Mountains of Oregon and Washington. 512 pp.

USDA, 1989. Caring for Our Natural Community. Threatened, Endangered, and Sensitive Species Program. p. 38 & 40.

Wilson, Cynthia, Richard E. Johnson and James D. Reichel. 1980. New records for the northern bog lemming in Washington. Murrelet 61:104-106.

APPENDIX F

IDAHO PANHANDLE N. F. PROPOSED INTEGRATED WEED MANAGEMENT PROGRAM